

IN THIS ISSUE

NEWS

4 April showers may bring flowers but not for IBM this spring. Drooping profits may mean power plucked from its stem by strong contenders Microsoft and DEC.

6 Leader of the pack HP offers the RISC-based X terminal, destined to beat the slower crowd of CISC-based terminals in popularity.

12 Wait a minute, Mr. Postman: Microsoft Mail software is significantly cooler than the electronic mail package on which it is based.

14 More power to you: Teradata's next generation database model generates two to three times the speed of the previous Model 3.

16 Music lovers can no longer mix and match favorite singles at record stores — innovator Phonetics' voice and supplies have dried up.

16 An anti-apartheid proposal is to be taken up again at IBM's annual shareholders meeting.

104 Wang's imaging software makes a "lovely connection" with IBM mainframe and Apple Macintosh platforms.

105 Weighing the pros and cons of AT&T's takeover of NCR, Comten networking product users tip the scales in favor of the proposed merger.

Quotable

"Apple has been hurt in the marketplace, so they're becoming more combative in the courtroom."

JIM POYNTER
WILLIAM R. WOODRUFF

On Apple's plan to broaden its suit against Microsoft.
See story page 4.

SYSTEMS & SOFTWARE

27 Everybody needs a little help from friends — even DEC, which has hooked up with two voice applications vendors.

PCs & WORKSTATIONS

37 IBM hopes users will soon be singing "Hooray for Hollywood" — loading not Timesdown but its Windows-based presentation package, coming in May.

41 Technology Analysis: Reviewers like Microrim's R:Base 3.1 for its rich programming environment and easy data access but say the program still wants for speed.

NETWORKING

49 Telecom companies' strategic alliances please some of the people some of the time — but many of the people are not at all pleased.

MANAGER'S JOURNAL

55 As portable PCs proliferate, IS managers maintain control with minimal muscle.

COMPUTER INDUSTRY

85 Is it almost curtain time for Banyan? Analysts question how much longer its Vines routine will keep the small company's show on the road.

PRODUCT SPOTLIGHT

61 There are four ways to buy an integrated CASE tool suite, and each poses its own advantages and drawbacks.

IN DEPTH

79 Why object-oriented technology enables you to reuse code and make maintenance easier. By Daniel Tasker.

DEPARTMENTS

8, 104 News Shorts

21 Advanced Technology

24 Editorial

59 Calendar

88 Computer Careers

97 Marketplace

101 Education & Training

102 Stocks

106 Trends

EXECUTIVE BRIEFING

■ The slumping banking industry is placing unprecedented demands on IS to do more with less. Even while cutting costs — sometimes through data center consolidations and outsourcing — banks are asking IS to play a key role in competing against non-traditional players such as AT&T and Sears. New systems must show a business benefit; banks' long romance with technology for its own sake is over. Pages 1 and 103.

■ Compaq slashes personal computer prices by up to 34%, apparently in response to slower sales in this year of cost-conscious IS. The cuts may not prompt a price war response by other PC makers, but they could signal the end of Compaq's role as the premium clone manufacturer. Page 1.

■ Apple plans to target Microsoft's Windows 3.0 in an expansion of its 1988 lawsuit against Microsoft and HP. Apple says it considers the release to be a derivative product from the original Windows 2.03. Users expecting a drawn-out courtroom battle say they do not plan to shy away from Windows in the meantime. Page 4.

■ Proliferation of laptop computers is posing a dilemma for IS management. Many firms are placing laptop management in the hands of end users but making sure they don't lose control, as happened with PCs in the 1980s. Page 55.

■ Microsoft and DEC post encouraging first-quarter results, brightening the computer industry gloom and doom. Microsoft appears especially well positioned as 'the most powerful company in the industry,' in the words of one analyst. Page 4.

■ Southwestern Bell taps company veteran Chyrene Davidson as its new head of IS. He replaces Kenneth Bender, who recently retired from the St. Louis-based regional holding company. Page 55.

■ The burgeoning market for imaging adds NCR to its lineup of vendors. At first glance, NCR's Document Management System earns high marks from users for functionality and price/performance. Page 1.

■ AT&T is still balking at the \$110-per-share takeover price demanded by NCR, but recent jumps in AT&T's stock prices are fueling speculation that it may bid higher for NCR. Meanwhile, NCR shareholder vote tallies this

week are expected to oust company Chairman, Charles E. Eley Jr. from the board. Page 105.

■ Signet Bank in Richmond, Va., plans to outsource its IS operations to EDS. A deal is expected to be signed May 1. Page 58.

■ Disaster recovery planning and fault-tolerant systems have IS breathing easier at the Federal Reserve Bank in New York. The bank moved quickly to put its plan in place after its funds transfer system crashed twice in two days in 1987. Page 31.

■ Computerworld Smithsonian Award winner Phonetics files for Chapter 11 protection. The developer of a system for linking cassette audiocassettes in music stores ran up against record companies concerned about royalty issues. Page 16.

■ The ideal CASE environment does not yet exist, but there are two approaches that come close: single-vendor tool suites and frameworks that integrate tools from other vendors. Page 61.

■ Object-oriented technology operates under different principles than those of traditional software development. Its object focus enables code reuse and ease of maintenance, helping companies get out from under a development legacy of tangled applications. Page 79.

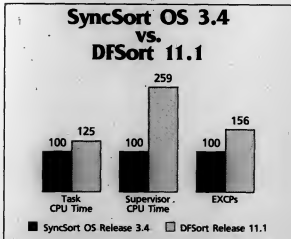
■ Checking employee references is an integral part of the IS hiring process, but it comes with its own set of problems. It is a time-consuming task that can break up against legal privacy issues. Page 88.

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Stability key to OS/2 users

BY PATRICIA KEEFE
Contributor

NEW YORK — A funny thing happened on the way to the IBM OS/2 forums last week. While IBM stressed 32-bit-enabled functionality and dramatic pricing options, enthusiastic users cited the promise of a stable environment capable of supporting key business applications.

"The issue isn't price or 32-bit capability," said George Oliver, manager of information delivery technology at the Toronto-based Royal Bank of Canada. "It's a quality thing pitched against all the hassles with Windows."

"Windows isn't stable," agreed Bill Zick, a consultant at Leveraged Technology, Inc. in New York. If one Windows application goes down, the whole system crashes, he said. Data integrity built into OS/2 Version 2.0 will protect both the operating system and other applications from crashing neighbors. That capability was demonstrated last week.

"Windows is a stable product," protested Steve Ballmer, Microsoft Corp.'s senior vice

president of system software. "Like any other product, over time people will find bugs."

OS/2 has better memory protection than Windows does, but Microsoft will address this in some release after Windows 3.1

coming. He said IBM learned its lesson from the "terrible trauma" of having to correct previous OS/2 quality problems with the IBM-built OS/2 Version 1.3.

Users and consultants who attended daylong briefings on IBM's desktop strategy were mostly enthusiastic about the star of the show — OS/2 2.0, slated to ship late this year.

IBM stressed that users will be able to run their desktop software investment, including Windows 3.0, unmodified under an attractively priced, 32-bit system.

But the bottom line for accounts such as the Royal Bank is that they can finally port mission-critical applications to "a true, architected" operating system. Oliver said OS/2 2.0 is everything OS/2 1.0 should have been from the start," said John Dunlike, a consultant at Workgroup Technologies, Inc. in Hampton, N.H.

The ability to run Extended Edition on non-IBM hardware opens the door to cost savings at OS/2 accounts previously hesitant to buy clones.

It could also hurt IBM hardware sales at the same time it

works to bolster OS/2 acceptance, said John McCarthy, a consultant at Forrester Research, Inc. in Cambridge, Mass. "This really opens up Fortune 1,000 accounts to clone makers," he said. But IBM Vice President James Camanovic predicted, "From '90 through '91,

we will, at minimum, hold market share."

Besides demonstrating 16-bit DOS and Windows applications running under OS/2 Version 2.0 at speeds faster than possible in their native environments, IBM announced aggressive price cuts.

Operation OS/2

Goed into action by anxious users and skeptical dealers, IBM went on the OS/2 offensive last week, unveiling a multipoint strategy for recapturing the desktop mind-set.

The strategy to boost acceptance of the operating system includes the following:

- Cutting the cost of OS/2 Version 1.3 Standard Edition from \$340 to \$150 and OS/2 1.3 Extended Edition from \$830 to \$690. IBM DOS users can upgrade to OS/2 1.3 for \$99 and to Extended Edition for \$655.
- A free upgrade to OS/2 Version 2.0 for customers who buy either OS/2 1.3 Standard or Extended Editions between April 17 and Dec. 31.
- The promise of running Windows software under OS/2.
- Announced support for OS/2 2.0 and the unbundled Extended Edition components from hardware vendors Compaq Computer Corp., Olivetti Systems & Networks and Tandy Corp.
- Pledges to port applications to OS/2 2.0 from Hewlett-Packard Co., SAS Institute, Inc., Bachman Information Systems, Inc., Intelligent Environments, Inc., Knowledgeware, Inc., Corel Systems Corp., Describe, Inc., Ventura Software, Inc., Metaphor Computer Systems, Inc. and others.

PATRICIA KEEFE

HP first to put RISC factor in X terminals

BY I. A. SAWAGE
Contributor

Last week, Hewlett-Packard Co. became the first major vendor to offer reduced instruction set computing (RISC)-based X terminals, according to analysts.

The nascent X terminal market, which Eileen O'Brien, an analyst at International Data Corp., estimated at only 64,000 units worldwide last year, is primarily compact instruction set computing-based. Basing the terminals on an embedded RISC processor increases power and is likely to become the norm for the market, analysts said.

An X terminal offloads display processing from a central processor, which runs applications. HP's X terminals are supported through its Unix-based worksta-

tions or other workstations through Transmission Control Protocol/Internet Protocol or Telnet protocols.

HP's terminals, called the HP 700/RX family, use Intel Corp.'s 1960 embedded RISC processor.

"An HP processor would be overkill in this situation," an HP spokesman said. Analysts said that an X terminal coming from IBM will only show the 1960. Earlier X terminals from HP used Motorola, Inc.'s 34610 chip.

The X terminals range from \$2,995 for a Model 19M1 monochrome station, which the company claims has a speed of 60,000 Xstones, to \$5,995 for a Model 19C4 with a color monitor and a performance rating of 75,000 Xstones. An Xstone is an indication of the speed at which X commands are executed.

IBM taps HP's Openview for Unix strategy

BY ELISABETH HURWITZ
Contributor

NEW YORK — IBM has announced plans to use pieces of Hewlett-Packard Co.'s Openview technology to fill a yawning gap in its Unix network management strategy.

IBM has licensed portions of the Openview technology from HP and is planning to implement them on an AIX-RISC System/6000 network management platform, although no time frame was offered for a specific product. The platform will initially manage AIX and some HP/UX workstations, said Bill Warner, IBM's director of network management.

IBM will base its Openview system on its Systems Application Architecture data structure and user interface, according to Warner.

This will provide consistency and easier integration between the Unix system and other IBM management platforms, such as Network and the OS/2 Extended LAN Network Manager, Warner added.

Unix connection

IBM's Openview product plans mesh with the needs of companies that combine a strong IBM host installation with a growing base of distributed Unix systems, said Don Canabek, president of Gen2 Ventures, a re-

search firm in Saratoga, Calif.

"Some departments don't have any IBM hosts at all, and IBM doesn't want to be left out," he added. In addition, Unix-based systems are more suitable for the emerging generation of distributed, graphics-based network management applications, Canabek said.

One likely customer of IBM's Openview system is Deere & Co. The company uses Netview to manage its Systems Network Architecture host network but has searched in vain for an effective platform to manage its Transmission Control Protocol/Internet Protocol worldwide network of Unix workstations, said Tom Hein, the firm's manager of technical support.

Providing integrated management has become crucial to Deere since it became dependent on Unix-based production applications that are distributed to factory sites, Hein said. "We have applications that run on both environments that have to work together," he added.

Still in question, however, is whether IBM will expand the Openview product-line beyond the departmental local-area network niche to the more general of enterprise-wide networks, Ernst & Young partner David Passmore said.

Warner left open the possibility that the Openview-based system could be used as an enter-

prise management system. Its scope would be limited only by the RS/6000's capacity, he added.

However, IBM is far from determining the system's ultimate role, Warner said. It will act as an element manager that can feed Unix LAN management data and alerts to IBM's central Systemsview and Netview platforms, he added.

The road to Openview

IBM became acquainted with HP on the two companies' joint submission of a Distributed Management Environment (DME) proposal to the Open Software Foundation (OSF), Warner said.

"It was a natural next step to look at Openview when we were looking at AIX network management," Warner added.

IBM will be pressured to grant its system full status as an enterprise management system if Openview becomes an official part of the OSF's DME architecture, Passmore said.

IBM will want to gain access to the broadening user and vendor base support that the system will garner as an official standard, he added.

Both IBM and HP have pledged to support DME, whether or not their technology is chosen by the OSF. However, IBM will find it harder to support the OSF platform if it is not based on Openview, Warner said.

X marks the spot

IBM terminals are carrying out a noticeable share of the terminals market

Percent of U.S. Shipments

Year	Low-end terminals	High-end terminals	X terminals	Total shipment (in millions)
1989	54.0%	41.2%	0.3%	2.83
1990	57.8%	41.6%	0.6%	2.83
1991*	58.6%	39.1%	2.3%	2.97
1992*	59.7%	36.4%	3.5%	3.01
1993*	60.8%	32.9%	6.3%	3.02

*Projected
Source: Market Intelligence Research Corp.

CV Chart: David Greenstein

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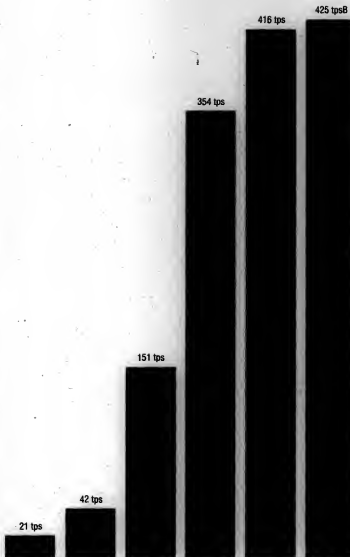
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NEWS SHORTS

HP plans gallium arsenide chips

Hewlett-Packard Co.'s mainframe-class computer, slated to be out this time next year, is expected to incorporate gallium arsenide chip technology. The eight-processor reduced instruction set computing machine "will not necessarily be more powerful than IBM's mainframes, but it will be up there," said Richard Sevcik, general manager of HP's Commercial Systems Division. Being developed in conjunction with Hitachi Ltd., the computer will have four to five times the speed of current HP machines with a 1G byte/sec. I/O bus, according to Sevcik.

Multiuser CASE tool offered

McDonald Douglas Information Systems International announced a multiuser version of its Prodit Workbench system for computer-aided software engineering (CASE) last week. The company, a division of McDonald Douglas Corp., said Prodit Workbench Multiuser gives better project control and enables a software development team working on a network to use a common, integrated repository to improve performance and first-time software quality.

Panel probes FTS-2000

A congressional panel last week lambasted management of the federal government's huge communications contract, charging that the agency oversteering carriers AT&T and U.S. Sprint Communications Co. had wasted millions of taxpayer dollars by steering too much business to Sprint, the higher cost provider. John Conyers Jr. (D-Mich.), chairman of the House Government Operations Committee, also charged that the U.S. General Services Administration (GSA) caved in to Sprint's protest at the GSA's attempts to recover some \$6 million to \$11 million in alleged overcharges.

Micrografix signs up for OS/2

Joining the OS/2 development team is Richardson, Tennessee-based Micrografix, Inc., which inked a long-term joint development pact with IBM last week. Micrografix will assist IBM in boosting the speed and performance of the OS/2 Presentation Manager graphics engine. Using an "advanced" version of its Mirvix technology, it will also develop migration tools for porting Windows 3.0 applications and device drivers to OS/2 Version 2.0. In addition, Micrografix will develop a Presentation Manager device driver development kit and will provide device drivers for a new Adobe Systems, Inc. Postscript, matrix film recorder and other drivers for OS/2 Presentation Manager.

Computer dealers merge

The latest example of computer dealer consolidation has chained Inacom Computer Centers, Inc. and Valco, Inc. The two firms announced a merger last week that should be finalized this summer. Both companies' directors and their stockholders will have roughly a 50-50 stake in the new firm, to be called Inacom Corp. The announcement closely follows the recent purchase agreements between Computerland Corp. and Nynex Business Centers and represents a consolidation trend among major personal computer resellers.

Tandem plans PBX link

Tandem Computers, Inc. is expected today to announce a software product designed to directly connect its hosts to AT&T and Northern Telecom, Inc. private branch exchange (PBX) systems. Scheduled for release in the third quarter, Tandem Call Applications Manager was designed to support call-center applications such as customer service, order entry, reservations and telemarketing. For example, a customer's caller identification number can be used to access the customer's file on a Tandem host and send it to the terminal of the service representative that is picking up the call. The initial software release, slated for the third quarter, will support Northern Telecom's Merlin 1 and Merlin 2, and AT&T's Definity Generic 1 and Generic 2 and System 85 PBXs.

More news shorts on page 104

Do Compaq's price actions spell war?

ANALYSIS

BY RICHARD PASTORE
and MICHAEL FITZGERALD

Compaq's dramatic personal computer price cuts last week herald a pricing battle to come, many analysts and users said. Others reasoned that because of the industry's major clone vendors, the war may not be that bloody.

Clone makers have largely traded in on their ability to dramatically undercut the prices of first-tier players such as Compaq and IBM. Therefore, some observers predicted the clones will be compelled to drop prices in response to Compaq's maneuvering and cuts IBM is expected to announce midyear.

If second-tier vendors do not continue offering large price differentials, users may see little advantage in buying their wares instead of Compaq's. "Any rational person would probably prefer a Compaq over anything else at that price just because the machinery runs so well," said Stephen Anderson, an information systems architect for the state of Washington. He spoke personally and not for the state.

"Dell Computer Corp. and PC Brand, Inc. will have to price accordingly, or they'll go out of business," predicted Compaq customer Andrei Chivvis, first vice president at Financial Guar-

anty Insurance Co. in New York.

It will be a tough pill to swallow, for some of the low-price PC vendors, however, which have less price flexibility. In January, for instance, Compaq enjoyed a 44% profit margin on its PCs. Everex Systems, Inc.'s margin was 26%, and Zee International, Inc.'s was 19%, according to Ladenburg, Thalmann & Co.

The industry is also anticipating price cuts. "This puts them more in line with IBM than

carving their own market niches and establishing credibility, which could shield them from some of the pressures to cut."

"Dell, Advanced Logic Research and others have built credibility for their distribution strategies and their PC product families," said Tom Willmont, vice president at Aberdeen Group in Boston.

Most clone vendors shrugged off the price cuts. "This puts them more in line with IBM than

Groundwater pollution

Compaq Computer Corp.'s price cuts put its products among the most aligned with competitors

MODEL	PRICE
Dell Computer Corp. System 320LX	\$2,199
Compaq Desktop 386S/20 Model 120	\$3,299
AST Research, Inc. Premium Race 386S/20	\$3,799
Compaq LTE 386S/20	\$4,799
NEC Technologies, Inc. Powermate 386/12	\$1,899
Compaq Desktop 286M	\$1,799
Advanced Logic Research, Inc. Powercase 33/4E	\$14,699
Compaq Desktop 486/33L	\$12,799

Prices are comparable but not necessarily identical

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cost 1486 chips from Intel Corp. To position their product lines for these arrivals, vendors may be forced to cut prices on high-end late 1988-based boxes.

The most well established clone companies may not have to cut as deeply as less-established ones, some analysts said. Compaq's competitors have been

with us," said Graham Beacham Jr., vice president and general manager at Tandem North America Corp.

"It's not a happy story with it. We thought it would be a lot more," said Kimball Brown, an Everest spokesman. "At the dealer level, it's only 5% or 10% less, so it's not a big deal."

Price cuts

FROM PAGE 1

Meanwhile, rivals NEC Technologies, Inc., Dell Computer Corp., Toshiba America Systems, Inc. and others have grown their domestic shares significantly, according to Storeboard/Computer Intelligence.

Early user reaction indicates Compaq may succeed in its goal. "If they provide [a] product to me at a very competitive price, they'll move me away from AST," said Mitchell Weiss, a partner at New York accounting firm Buchhalter Tunick & Co.

Weiss is a Compaq customer who recently strayed to AST Research, Inc. for some desktop purchases.

The heat is on

At the Baltimore Federal Reserve Bank, pressure has been mounting on information systems departments to buy cheaper clones. The new price will relieve that pressure, said Michael Ball, data processing coordinator at the bank.

"We can cut costs and boost our volumes from Compaq or Dell. They'll pick up some business here; it will help us buy more equipment from them,"

Hood predicted.

Compaq dealers are already seeing positive customer reaction. Corporations with outstanding bills have quickly settled on Compaq after hearing of the cuts, said Ed Michelson, co-owner of a Computerland Corp. outlet in San Diego. "It made the clone competition go away."

Compaq's price shift comes none too soon, observers said. Because the disparity in pricing was "almost embarrassing," Compaq's status with major corporate clients was growing "tense," said Matt Fitzsimmons, owner of a Computerland dealership in White Plains, N.Y.

In addition to market forces, Cooley attributed the timing of the change to the economy, market slowdown, rising competition and the fact that Compaq's manufacturing infrastructure is now capable of handling higher volume production.

Observers cautioned that the discounts in list price will not likely transfer dollar for dollar to street prices.

Compaq has passed some of the profit margin squeeze off onto its dealers, which will receive lower vendor discounts. With margins tight already, "no dealer in his right mind will slash his street price the same per-

centage as Compaq slashed their retail price," Michelson said.

Many observers predicted a price war. "This foreshadows some very bloody days to come in the PC market," said Ben Rose, a senior analyst at Technology Investment Strategies Corp. in Framingham, Mass. Rose and others said they expect IBM to be the slowest to respond because it is insulated by its more expensive product line.

Is it a big deal?

Executives at AST and Northgate Computer Systems, Inc. downplayed the seriousness and potential impact of the price cuts. But others are taking it seriously.

"It's too early for us to take any action, but we've really got to look at [pricing] much more closely," Dell spokesman Brian Fewkes said.

Dell was slapped with a Compaq lawsuit in the U.S. last week that charged it with false advertising in its long-running price comparison campaign.

Wise Technology said it hopes to avoid a price war but will respond if it feels pressure from other second-tier players. "It's going to be a hell of a year," said Ron Okamoto, director of product marketing.

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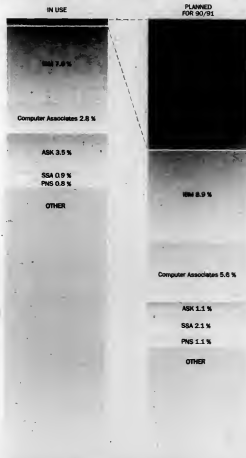
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AS/400

CONTINUED FROM PAGE 1

information systems at Chemical Waste Management, Inc. in Oakbrook, Ill. The company has 20 AS/400s at its headquarters, with another 20 located at other facilities and remotely managed.

Perhaps the greatest relief for capacity-strained users will be the arrival of the mainframe-power Model D80, reported to have 2½ times greater throughput than the present top-end Model B70.

The Model D80 equals an IBM 3090 Model 200 in capacity, communications ports, disk space, memory and internal I/O architecture, and it can handle a mainframe-style work load, said Teresa Elms,

president of Elms Technical Communications in San Diego.

"IBM has completely refreshed the whole product line," Elms said. "They changed the processor technology, the internal packaging, everything."

Some things won't change

What will not change, however, is the ability of the D models to run all previous AS/400 applications and peripherals. While the D80 processor will not run any faster than the current B70 processor, analysts noted, the presence of two of them doubles the machine's work load capacity.

One company already in line for a Model D80 is Hills Pet Products, Inc. in Topeka, Kan.

"We need an upgrade pretty badly," said John Wietzig, manager of computer operations at Hills Pet Products. "We're looking at getting two D80s; one here and one in our distribution center in California."

Among several improvements to the OS/400 operating system, Wietzig said he is particularly interested in a "performance adviser" tool that analyzes machine performance and teaches users how to better tune their AS/400s.

"That is something really needed," Wietzig said. "On the B70s, tuning is a full-time job."

Batch processing has been another weakness of the AS/400, he added, but a dual-processor architecture should strengthen those capabilities.

Opening up
AS/400

IBM is repositioning its premiere midrange Application System/400s as "full-range" systems and will start trumpeting a theme of "openness" for its proprietary line.

That does not mean there is a Unix operating system in the AS/400's future, however. Rather, it signals the arrival of more industry-standard open interfaces and development tools, improved Compilers and the ability to attach the AS/400 to multivendor networks.

Analysts who have been bemoaned on the new machines said IBM is anxious to move its profitable midrange line into a position where it can be hawked as an applications file server.

"IBM does not want to position the AS/400 as a conventional local-area network server or data storage device for PCs. It's just not cost-effective," said Teresa Elms, president of Elms Technical Communications in San Diego. "They do want people to start thinking of it as an applications server for a network."

IBM will also be unveiling personal computer connectivity products, plus client/server and cooperative processing applications from third-party vendors. Synco, Inc. in Larkspur, Calif., for example, is expected to announce today an entry-level computer-aided software engineering tool for low-end AS/400s. The applications generator tool, which IBM will distribute, produces database designs and native RPG applications with SQL generation.

The price and power of the D models are also expected to accelerate the migration of hordes of hesitant System/36 users into the AS/400 fold, said Carson Soule, president of Computer Applications Specialists, Inc. in Beltsville, Md. "System/36 users who were looking at having to spend \$150,000 to move to an AS/400 will now be looking at \$100,000 — and price is a key issue with these people," Soule said.

IBM will be rolling out a host of new or improved products for just about every nook and cranny of the AS/400, analysts said.

One example is the Programmable Input/Output Processor, which will allow users to attach foreign devices, such as electronic weight scales or radio frequency input programmers, to feed data directly into the AS/400 database.

"That would come in handy for us because we use radio frequency input for tracking waste materials through our facilities," said Mike Hansen, director of IS at Chemical Waste Management. "Right now, we test that through personal computer networks, but a direct interface for that kind of stuff to the AS/400 would be pretty neat."

MARYFRAN JOHNSON

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Michael L. Sullivan-Trainor, Senior Editor, Computerworld, in the March 25, 1991 issue

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Microsoft beefs up E-mail package and price

BY JIM NASH
OF WASH.

REDMOND, Wash. — Network administrators surprised by Microsoft Corp.'s new electronic mail package might be suffering more from sticker shock than amazement with the product's speedy introduction.

One systems analyst estimated his company will have to spend three times the money for Microsoft's mail package compared with the Consumers Software, Inc. product on which it is based.

Microsoft announced last week the shipment of Microsoft Mail Version 2.1

for personal computer networks. A Microsoft spokesman said the software is the firm's first mail product for PCs and supports DOS and Microsoft's Windows. It currently markets Microsoft Mail for Apple Computer, Inc. AppleLink networks.

Microsoft Mail for PC Networks is a repackaged, debugged and repiced version of Consumers Software's Network Courier Version 2.1. Microsoft bought Consumers Software early last March to accelerate the Network Courier line.

While few industry observers said they were surprised by the acquisition, some said they are uncomfortable with Micro-

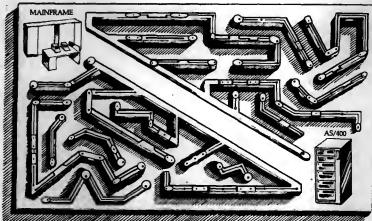
soft's pricing strategy for Microsoft Mail. One systems analyst who participated in a beta test of the product said the price for a complete 100-user version of Microsoft Mail is about triple that of a comparable version of Network Courier from Consumers Software.

"We'll pay it," said the user, who requested anonymity, "but we'll be looking for much more support" from Microsoft. Microsoft Mail is being sold in two pieces. For \$695, customers can buy a complete mail server and a single-user license. License packages for five, 20, 100 and 500 users are sold separately for \$395 to \$22,500. Free upgrades are available to

licensed Network Courier users.

The user said Consumers Software packaged server components separately, but purchasing Network Courier for 100 users in the past meant an outlay of about \$2,000. The same package from Microsoft will run \$6,195 before taxes. In addition to better support, the source said he would like to see dynamic data exchange features that would allow text produced with Microsoft Word, for example, to be directly sent over Microsoft Mail. Right now, that is a two-step process.

Shane Kim, product manager for Microsoft Mail, said costs did not actually triple, given that many previous limitations on the software have been lifted. For instance, Kim said, Microsoft Mail supports many network operating systems, including those from Novell, Inc., IBM, Banyan Systems, Inc., 3Com Corp. and Microsoft. Previously, he said, customers had to buy Network Courier packages for each networking system.



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Racal to unify by restructuring

BY JOANIE M. WEKLER
OF STAFF

SUNRISE, Fla. — Racal-Milgo last week confirmed a corporate reshuffling aimed at alleviating customer confusion and headaches in tapping its disjointed spectrum of networking products.

The expected reorganization of Milgo and siblings Racal Interlan, Racal-Milgo Sky Networks and Racal-Quanta, all owned by the \$3 billion, UK-based Racal Electronics PLC, reportedly includes a 350-person layoff at Milgo during the next 30 days. The \$300 million Milgo is known chiefly for its modems, multiplexers and associated network management systems.

James K. Norman, president of Milgo and Racal Data Communications, U.S., said the 13% staff reduction is part of an effort to "pull together our acquisitions into a unified rather than fragmented" organization that addresses customers' growing needs for enterprise-wide networking and one-stop shopping.

However, some industry observers said a Racal consolidation may not be as important to customers as new product development and a better understanding of the vendor's offerings.

Steven A. Taylor, president of Distributed Networking Associates in Greensboro, N.C., indicated that Milgo is hurting financially because the home-division multiplexer market is flat, and the company has yet to produce a new generation, frame-relay switch. "Frankly, I don't see a great deal of pressure from customers to one-stop shop. Users just want good equipment at good prices," he said.

Milgo customer Bill Conley, manager of information technology services at Loral Aerospace Corp. in Newport Beach, Calif., agreed: "I look to an AT&T, IBM or outside consultant for architecting my network. I then turn to Milgo and ask, 'What pieces can you supply?'"

Part of the reorganization already in effect is the replacement of Randy Phillips, president of Racal's Mass-based local-area network company Interlan, by Robert A. Steinkraus, formerly senior vice president of finance at Milgo.

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Teradata to speed up CPU

BY JEAN S. BOZMAN
CIRCUIT

EL SEGUNDO, Calif. — In New York today, Teradata Corp. is expected to announce a new generation of its DBC/1012 database computer — a Model 4 that will run two to three times faster than the 2-year-old Model 3.

Teradata Chief Executive Officer Kenneth Simola, in a prepared statement, said the new database machine gives customers "a single-image database — one that handles the most complex queries while simultaneously performing batch

and transaction processing." The machine, priced at \$816,000 or more, is targeted at the largest Teradata sites.

Industry analysts said the firm has about 130 large sites, excluding sites gained in Teradata's 1990 acquisition of Los Gatos, Calif.-based Sharebase Corp., which makes smaller database machines.

The new Teradata computer replaces the Model 3's Intel Corp. 80386 microprocessors with more powerful Intel 486 chips. Each 486 is bundled with 256K bytes of cache memory and 8M bytes of main memory.

Teradata's Ynet communications ar-

chitecture connects the multiple microprocessors, ranging from six to 300 per installed machine, into a cohesive parallel-processing computer. Theoretically, Teradata customers could connect up to 1,000 microprocessors, company sources said. Analysts reported that current customers have used configurations with up to 300 80386 processors.

Although Teradata claimed a threefold increase in processing speed over the Model 3, one industry analyst noted that customer applications are likely to run slightly slower than that.

"The benchmarks they've run on it show good performance improvements but just about what you would expect when you bump from a 386 processor to a 486 processor," said Roy Schulte, pro-

gram director at Gartner Group, Inc.'s Software Management Strategies service in Stamford, Conn.

Other systems features, however, will boost overall performance, analysts said. Teradata improved I/O bandwidth and more than doubled the storage capacity of the system's disk drives from 1.2GB bytes apiece to 2.5GB bytes.

"They've increased engine speed threshold, but they've also made the I/O bus run five times faster," said Perry Harris, director of management strategies at The Yankee Group in Boston. Up to 16 of the new disk drives can be placed in a single Teradata cabinet, Harris said.

An upgrade package will allow some Model 3 buyers to swap out CPU boards, although the cost is cheaper if they have purchased the Model 3 since July 1990, Schulte said. A minimum configuration of the Teradata DBC/1012 Model 4 is priced at \$816,000. Teradata sources said last week early users have already installed the Model 4 machine, including AT&T, Delta Air Lines and Koch Industries, Inc., a Wichita, Kan., oil refinery.

Schulte said more than one airline site plans to use the Teradata machine for capacity planning based on analysis of thousands of passenger records stored in the database "engine."

DEC, Maspar join forces

BY MARYFRAN JOHNSON
CIRCUIT

MAYNARD, Mass. — Digital Equipment Corp. and Maspar Computer Corp. in Sunnyvale, Calif., made it official last week that they will jointly market and develop software for Maspar's massively parallel systems.

As its first foray into the massively parallel market, DEC will resell Maspar systems worldwide and license some of its own patented software technologies to Maspar. DEC plans to tie the Maspar MP-3 systems, introduced in January 1990, into its VAX networks.

Supplying users with debugging and performance tools and producing compilers for the Fortran and C languages are also high on the work list, said Samuel Fuller, vice president of corporate research at DEC.

Customer interest

The company's decision to enter a niche market area — where annual revenue is still less than \$200 million — was driven by customer interest, Fuller said.

"We have a set of major customers in the oil industry, government labs and research universities who want to integrate these massively parallel systems into their DEC systems," he added.

Massively parallel computers usually have 1,000 or more microprocessors and operate by spreading data across a large number of processors to work simultaneously, making them ideally suited for applications such as image processing, database searching, seismic data processing and other compute-intensive scientific work.

Although DEC has made a minority investment in Maspar, both companies are free to pursue other partnerships.

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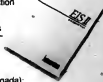
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IBM meeting to address South Africa again

Shareholder support has been growing for company to end all business ties with country

BY J. A. SARGE
COWLEY

For the fourth year in a row, IBM stockholders will consider a proposal to stop all direct and indirect sales of computers to South Africa until apartheid ends.

The resolution, to be offered at the annual shareholders meeting in Kansas City, Mo., next week, has gained steady support from IBM employees and religious organizations, said James Less, author of the resolution and a staff engineer at IBM's semiconductor plant in Mannheim,

Va. "I believe IBM's sales to South Africa strengthen the white rule, adds to its military power and puts human lives at risk," he said.

IBM's response stated that apartheid is "morally repugnant," but that "responsible business activity and social programs carried out by American and other companies in South Africa have contributed to ending apartheid and creating a post-apartheid economy and society."

In a proxy statement, holders of 87,750 IBM shares — endorsed by 554 employees from the U.S., Europe and Ja-

pan as well as 17 church groups — made their intent known to the company. Shareholder support has been steadily increasing, from 9.9% in 1988 to 17.2% last year.

Last week, the 12-nation European Community (EC) agreed to lift economic sanctions against South Africa, despite pleas from the African National Congress. The EC cited continuing government steps to dismantle apartheid. The Investor Responsibility Research Center, Inc. in Washington, D.C., however, pointed to continuing racist policies of the South Af-

rican government, such as the black majority being prevented from voting.

IBM's sales to South Africa through a diversified arm affect its ability to sell to local governments in the U.S., which Less said presents the threat of more lost profits than the company stands to gain from South Africa. IBM estimated in 1988 that sales from South Africa amounted to .05% of its income. "It has not been sized since then," an IBM spokesman said.

About 115 city, county and state governments have statutes prohibiting buying products from companies that do business in South Africa. However, some have construed that to mean that if a company sells through an arm's-length relationship, it does not violate local law.

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Audio innovator files Chapter 11

BY JOANIE M. WEXLER
COWLEY

REDWOOD CITY, Calif. — Cold feet in the music industry have bootied technological innovator and *Computersworld* Smithsonian Award winner Perionics Corp. into Chapter 11 reorganization, according to company founder Charles Garvin.

Garvin said "industry acceptance" issues have forced Perionics to withdraw its custom audiocassette recording systems from 250 retail stores throughout the country. Discomfort on the part of the record companies about the firm's innovative method of music delivery and its perceived potential for cannibalizing new album sales, he said, have caused the recording companies to cease supplying Perionics with new music releases, drying up its business.

Perionics won a *Computersworld* Smithsonian Award for technology innovation last year (CW, July 23, 1990) for developing a data compression-based system that allows customers to choose a custom repertoire of musical selections. Up to 90 minutes of music can be ported to an audiocassette from a compact disc-resident database in about 10 minutes.

Effects on sales

"The Perionics system wasn't inhibiting my album sales at all; in fact, it was bringing in business," said George Mull, general district manager at Coconut Music & Movies in Natick, Mass. Mull's Perionics system had been in his store since it opened last June, and Mull described it as a low-maintenance system that he regretted losing.

Garvin said that Perionics market tests in stores chosen by retailers showed no negative impact on album sales; rather, they showed an increase of about 39% in label and artist royalties, he said. Perionics' arrangement with six major record companies entitled the companies and artists to "the richest royalties paid in the industry," he said.

Garvin is currently ramping up a direct marketing campaign for selling customized tapes of the songs he has already licensed to "oldies" audiences. "Our experience is by no means unique," he said. "The entertainment companies were bitterly opposed to the home movie and cable television innovations in their day."

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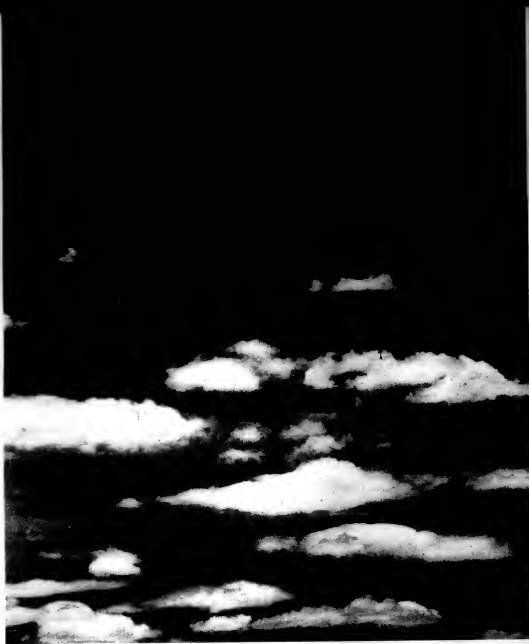
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Complex rotorcraft flight simulators soar

Georgia Tech's training device lets pilots keep their feet on the ground while learning how to navigate the skies

BY SALLY CUSACK
CW STAFF

Flight simulators are widely used to train civilian and military pilots flying fixed-wing aircraft. Now, researchers at the Georgia Institute of Technology in Atlanta are working on a flight simulator for rotorcraft, which have more moving parts than airplanes and subsequently are more difficult to simulate.

The Georgia Tech simulator emulates the U.S. Army's UH-60 Blackhawk helicopter and will later emulate the Apache helicopter, which played a key role during Operation Desert Storm in Kuwait and Iraq. The system will be capable of simulating the flying of any rotorcraft for which mathematical models are available, researchers said.

"We want to enhance the pilot's perception of what it's really like to fly the craft," said Maj. William Lewis, one of the researchers and a test pilot in the U.S. Army.

Instead of relying solely on airborne practice, pilots complete portions of their training on the ground,

using Disney World-like parabolic simulations that reproduce the feeling of movement and actual flight.

"It's similar to some of the attractions at Epcot Center, where you're strapped into a seat anchored to a floor, and the visual display creates the illusion of movement," Lewis said.

Just the beginning

The first phase of the project includes only forward-looking displays for now, but side-view displays will soon be added to the system to enable pilots to brush up on their hovering skills. Engineers will also be adding enemy attack simulations, which will allow pilots to stage mock battles.

At Georgia Tech, the research team is developing its flight simulator on a Silicon Graphics, Inc. VTX 380 Povervision series workstation, which features eight parallel processors. The simulator is also equipped with Flightlab 480 Simulation software from Advanced Rotorcraft Technologies, Inc.

Most existing flight simulators rely on serial processing, which produces a fractional delay between command and response times—up to

one-third of a second.

Tests show that parallel computing architecture is ideal for simulating typical helicopter flight movements, such as hovering, reversing directions and maneuvering in tight spots.

According to Lewis, parallel processing increases the system's response time, which is extremely valuable when training pilots.

The simulator is also ideal for training military pilots in the simultaneous multitasked tasks such as flying the craft, finding targets and shooting weapons, Lewis said.

"Reactions must be instantaneous for the pilot to know the system is responding," Lewis explained. "One of the main advantages to parallel architecture is a .057 [of a second] execu-



Flight simulators that are designed at the Georgia Institute of Technology simulate lifelike experiences for pilots during their training.

tion time."

To run the simulator in real-time mode, individual components of the machinery are broken down into specific segments, and then the segments are run together simultaneously. The technique allows for a smoother, more rapid flow of data, and the graphics software then adds the texture to allow pilots to discern motion in a three-dimensional format.

Expert system calculates space shuttle payload configuration

BY MICHAEL A. ALEXANDER
CW STAFF

Calculating how a payload should fit in the cargo bay of a space shuttle takes considerable experience. So formidable is the task that only two men can do it with any certainty. One of those men retired recently, and the second is nearing the day when he will do the same. That thought worried the ground systems integration technical staff at Rockwell International Corp.'s Space Systems Division enough that they developed an expert system to carry on when human experts are not available.

"The shuttle program now spans a generation," said James Engle, ground systems engineer. "One of our two experts for analyzing payload-to-ground systems compatibility has already retired, and the other is a senior member of the technical staff. It has become imperative that we capture the knowledge these men pos-

sess because otherwise, when they leave, their knowledge and skills leave with them."

The Rockwell staff members and Expertelligence, Inc., a Santa Barbara, Calif., expert system shell devel-

allows engineers to interactively configure a payload on-screen and analyze it to see how well it fits in the cargo bay of a space shuttle.

The expert system, which runs on an Apple Computer, Inc. Macintosh II, includes a graphical user interface that engineers use to fit together pieces of a payload, like a jigsaw puzzle.

Payloads—satellites, telescopes and gear needed for scientific experiments—must be stowed on board while the orbiter is in its vertical launch position. The entire cargo must be designed to slide flawlessly into place as a single unit so that nothing obstructs the closing of the payload bay doors. The trunnions, or pins, supporting each of the payload's components must slip into their holding fixtures within minute tolerances of only one-hundredth of an inch.

Each payload configuration is unique, and the often takes weeks for experts at Rockwell's Space Systems Division to assemble payloads and try out each configuration on paper. "At any given time, there will be several different flights in work, and each flight requires at least four reviews," Engle said.

G-Fit has been used in configura-

tion testing on several shuttle missions, although it is not the sole testing tool. "The overall task has required about 40 hours per week," Engle explained. "In automating the routine and repetitive manual activities, we have been able to recapture a large block of time that can be better used for creative problem solving."

On the inside

The knowledge base contains two key components: the physical dimensions of the payload bay and mission-critical devices mounted on the bay's sides as well as the rules governing the use of the available space and devices.

The G-Fit operator adjusts the overall configuration of the payload drawing from a palette of objects representing payloads of different sizes, cameras and other components. Payloads created on-screen can be tested and refined until the knowledge base signals that the cargo bay can accommodate the configuration.

Once testing is completed, the operator produces a printed report and drawing of each payload for contractors, who determine whether the planned unit can be conformed to the payload configuration. If not, they propose alternatives and submit them to a new round of testing.

Eventually, the payload is assembled and inserted into an upright, cylindrical payload container that is an exact duplicate of the orbiter's cargo bay. The payload is then transported to the launch site and loaded into the orbiter.

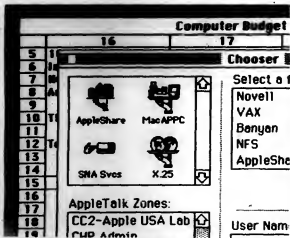


G-Fit allows engineers to analyze a payload on-screen and make adjustments in the configuration for storage inside the space shuttle's cargo bay.

oper, have created an expert system called G-Fit to capture the knowledge accumulated by Rockwell's configuration experts over the past 15 years.

G-Fit, short for Ground System to Flight Payload Integration Tool, is an object-oriented expert system that

We're open



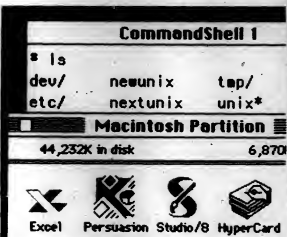
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Macintosh shares data with DOS PCs via Novell, 3Com, Banyan and more. Macintosh reads and writes DOS files on a floppy disk. Macintosh runs DOS programs. Maybe your next DOS computer should be a Macintosh.



Information isn't much good to people who can't get to it. Macintosh sorts out the complexities of multiple computer systems and presents vast information to people at the desktop in a single, consistent way.

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While diversity may make life rich and fascinating, it makes life as an IS manager something short of serene.

What is politely referred to as the "multi-vendor environment" is an amalgam of disparate hardware, incompatible operating systems, dissimilar databases and multiple networks.

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EDITORIAL

Blind ambition

MICROSOFT MUST BE feeling like a pincushion right now. First there was the revelation that the Federal Trade Commission was investigating it for allegedly trying to corner the PC operating system market. Then that probe broadened to include a whole host of Microsoft activities in both software and hardware. Then Apple, perhaps smelling blood, told Microsoft last week it would broaden its copyright infringement suit to include the hot-selling Windows 3.0.

Microsoft has reacted to its recent adversity a little bit like a hurt puppy. It professes bewilderment that so many people could wish it ill. It has even asked industry opinion leaders to help it get at the root of its image problem.

It shouldn't have to dig too deep for an answer. The fact is, Microsoft *does* dominate the PC software market to a degree that makes many people very nervous. It has achieved that success through a combination of excellent technology, brilliant marketing, visionary insight — and blind ambition. Where it has gained the upper hand early (MS-DOS), it has preempted alternatives. Where it has not a worthy foe (the Apple Macintosh), it has turned competition into opportunity. It has stuck with technologies it believed in (Windows) long after most companies would have written them off. It has been quick to get out of markets (Access) where it realized its product wasn't up to snuff. It has danced with a bear (IBM) and led the waltz.

But Microsoft has also made enemies in its climb to the top. Ask 3Com, which had and then lost a preferential marketing deal for LAN Manager. Ask Lotus, which invested in OS/2 Presentation Manager largely on the strength of Microsoft's commitment. Ask IBM, for that matter. The Microsoft magic has been based in part on its willingness to put its own ambitions ahead of others'. That ambition is what draws such scrutiny to everything Microsoft does. It doesn't matter that the company claims its pinpoint operating system has nothing to do with the technology that Go Corp. once demonstrated to it in private. Competitors will cry foul. It makes no difference that Microsoft claims to have a wall between its systems and applications groups. Success engenders suspicion. It might argue that things changed after it declared in November 1989 that Windows wouldn't challenge OS/2. That's little comfort to the developers who poured millions down the OS/2 drain.

Microsoft appears to want to dominate the market and still be loved. Unfortunately, its current methods don't permit this. If the firm indeed wants to project a gentler image, it should be more willing to share or even concede some markets instead of trying to bulldoze them. It should learn to live with commitments it has made, even when they aren't in its own best interests. Perhaps it should even cut short the monopoly debate by putting the MS-DOS standard into the public domain. These changes wouldn't boost Microsoft's short-term profits, but they would buy the company the goodwill it apparently craves.



LETTERS TO THE EDITOR

Readers rally for the repeal of Section 1706

I enjoyed Mr. Costes' analysis of technology in "Leaving the Computer Stone Age" (CW, April 1). However, I'm afraid the U.S. will have a tough time leading the way out of this era.

It took *Computerworld* four years to come out against the bias of Section 1706 where the net results were that many independent contractors lost their livelihoods, and competition was stifled in the consulting market. I take it that *Computerworld's* stand was timed to coincide with Mr. Costes' article.

We will not leave this Stone Age until the U.S. takes a more long-term "what is right" approach on tax law and funding and not the current "where do we make up the shortfall in revenue" attitude in Washington.

Americans must convince their politicians to stop thinking of short-term special interest and start thinking long term on tax law and funding affecting education, environmental and health care issues. Maybe then the American manager will learn another programming language, and trade newspapers will offer classes in leadership.

Steve Lanza
Covio Computing Co.
Evanston, Ill.

You really hit the bull's-eye with your "Repeal 1706" editorial (CW, April 1). Section 1706 has not benefited our customers, our industry or our country. You mention that 1706 was "tacked onto the Tax Reform Act without debate or proper hearings." Adapto members have not debated or held hearings on the issues either, and yet our dues are spent to support 1706.

We don't need laws that re-

strict the rights of small businesses. Entrepreneurs have built our software industry. Many of today's leading software companies began as small professional services companies. Restricting the right of a software professional to operate as a small business can only have a negative impact on our country's leading-edge position in software technology.

I hope that editorials like yours will lead to the death of unnecessary legislation like 1706. Now is the time for Adapto to unify its membership around the real issues facing the information technology industry. Rather than stifling small businesses, invest in software innovation. This is the growing ground for our strong, vital software and services industry.

William M. Bensch
President
Data Base Architects, Inc.
Alameda, Calif.

I have to compliment you on taking the correct side of the 1706 issue with your editorial (CW, April 1).

There are two points, however, that need to be clarified, which you did not illuminate. First, 1706 is not revenue neutral; it costs the government money. Independent contractors are the most efficient means of delivering computer services to businesses. This efficiency allows greater revenue and thus higher taxes paid than large service organizations with tax-deductible unnecessary overhead.

To use myself as an example, as an employee in 1985 I made \$36,000 and paid \$4,200 in taxes; in 1986, I made \$60,000 and paid \$17,000 in taxes. Last year

I paid more in taxes than my combined taxes from 1978 (my first computer job out of college) to 1985 (my last year as an employee). Anybody claiming that the government makes more money with me as an employee is clearly misrepresenting the facts for their own hidden agenda.

Which brings up my second point. Adapto should be publicly berated for their support of 1706. They are acting against the best interests of the computer industry as a whole. The main supporters for 1706 are the large inefficient service firms whose direct competition is the independent contractor. Their inability to compete on equal terms has left them pursuing legislation and other economic harassment to maintain their market share.

Let the industry beware. The next step for these organizations, especially if 1706 gets repealed, is certification. Who do you think will predominate the certification boards? Those who donate large sums of money to politicians to pass bogus legislation in the middle of the night, that's who.

Steve Johnson
President
Software Development Factory
Hart Valley, Md.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Leberer, Editor in Chief, *Computerworld*, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8501; MCI Mail: COMPUTEXT@WORLD. Please include a phone number for verification.



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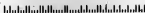
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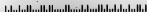
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Knowing too much but too little

Can you be both over- and underqualified? The job market says 'yes'

MELVIN NISKA



It is a phenomenon of the economic times that some of us are overqualified and underqualified at the same time. I know this firsthand because on Dec. 11, I was "downsized" out the door at Unisys.

The euphemism "overqualified" means that your present or most recent salary is greater than what employers want to pay in today's "bargain basement" job market.

Never mind that today a person has accepted the fact that to become re-employed means adjusting to a reduced salary. Never mind that re-evaluation and financial regrouping has taken place, along with self-analysis, personality testing, career assessment and so on. The people with jobs to fill just don't believe it. They are afraid that if they hire me, I'll be gone as soon as time improves.

This focus on salary is also a handy way to assess resumes. Depending on whom you talk to, the number of resumes that come in when a job is advertised

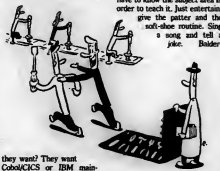
is either 300 or 1,000-plus. So it helps to put this in the ad: "Include salary history. Applications without salary history will not be considered." This allows them to screen out all of us who have 30 years of experience.

However, this kind of thinking is flawed for several reasons. First, the prognosis for business "opening up" anytime in the near future is bleak. Unisys has discarded only about half of its projected 1991 employee count. IBM has announced that another 14,000 jobs will be eliminated. And those willing to make predictions say instances like these are just the beginning. Hence, the employer's market we are looking at today should be even more skewed tomorrow. This makes the possibility of job-hopping almost nonexistent. But watch as carefully because I quit a job 22 years ago!

I'd be underqualified at the same time means that my resume does not contain the proper acronyms. Consequently, if I am not screened out by the "salary history" rule, I will be eliminated by a junior personnel person using an acronym template.

An example is Cobol. Firms want someone who knows Co-

bol. I know Cobol. Have taught Cobol and have even created instructional material for structured Cobol that has brought some joy into the lives of Cobol practitioners. But what Cobol do



they want? They want Cobol/KICS or IBM mainframe Cobol or Application System/400 Cobol or HP/Mammon/Satcom. The rejection letter to my application for an AS/400 position came back at Mach 4.

Another example is relational databases. I have been working with SQL since it was first developed in the Unisys 1100 series: RDMS 1100, which has competi-

ed well with DB2 all over the world. Dr. Codd's definition is universal. But if you don't have DB2 SQL or Oracle SQL, then you don't have any SQL experience worth mentioning.

Then there's the other dogma — teaching vs. doing. "But you only taught SQL, you haven't really had to know it." That's the way people think in today's job market: A person doesn't have to know the subject area in order to teach it. Just entertain, give the patter and the soft-shoe routine. Sing a song and tell a joke. Bolder-

of priorities for scheduling my work and the work of others. I've settled office wars and smoothed ruffled feathers. But I have no "track record" as a manager, so I'm easy to screen out.

What one can do, is willing to do and has done in the past are confused here. I've done a lot of things in the past that I'm not willing to do in the future. I've washed a lot of dishes. I've cleaned latrines. If there's one thing I'm grateful for, it's that I got out of the mess hall before the job market turned sour.

Trying to figure out what a person is capable of and wants to do is way too complicated for employers now.

Probably because I've spent almost my whole career helping people adjust to computerization, it comes as a shock to see that employers are now insisting on ready-trained employees.

I was a technical writer for seven years, but the ads for technical writers insist on the applicant already knowing the word processor of the employer's choice. Yes, it will take a few days to get accustomed to a new word processing package, but the skill of the wordsmith transcends any tool. Furthermore, no tool, by itself, is going to produce great literature. It takes an underqualified person to do that.

Niska makes his monies from his home in Andover, Mass.

Financial data often yields false positives

BILL FROMM



Many people believe that financial statements disclose how well their company is competing in the marketplace.

That simply isn't true. The only accurate measure of how successfully a company is competing in the marketplace is the trend line of its share of the market. And, sadly, most companies don't know what their market share is.

Most chief executive officers use operating statements to evaluate the health of their companies. But these statements simply describe past profits or losses. They won't give you any clue as to the future. If you did, banks wouldn't make bad loans. Operating statements ignore the strategic health of the company.

Traditional measures of success ignore how the competition is doing. The measurements don't take into account what's going on in the industry. They assume that your company exists in a vacuum.

No measurement except the

market share trend line will tell you how you're doing in relation to your competitors.

Profits won't tell you. You can make money while you lose customers to the competition. Just cut back on the quality of the goods or services you provide while maintaining the price you charge. You'll lose your repeat business, but you'll make huge profits until you run out of new customers. A company can gain a lot of money simply by harvesting — but it could be in bed shape for the future.

Returns on net assets won't tell you. That figure reveals only how the investors are making out. It doesn't consider the return that the competition is getting, and it won't give you any idea how the company is going to do in the future. You might as well consult an astrologer.

Another possible problem: Even if CEOs recognize the importance of their companies' market share, many are unsure of how to measure it.

That's where you, as an information systems manager, can make a difference. Instead of continuing to oversee the production of financial reports ac-

ording to old and faulty formulas, propose an alternative. Taking the initiative in this way probably won't get you a bigger IS budget, but it is likely to earn you a lot of respect as someone who really knows how information should be used and isn't reluctant to propose an idea that won't require a big investment in new technology.

You don't have to spend a fortune in research to find out how you're doing in relation to the industry and your competitors. You don't need a fancy new computer system or expensive research sources. You don't even need (and this may sound sacrilegious) exact numbers. It is the trend line of your market share that is important, not whether you're measuring it down to the 10th decimal. You can figure an accurate trend line with less than exact figures as long as you measure your share of the market the same way every year.

The first step you can take toward figuring your company's market share and making financial reports more meaningful is to deliver your company's market — both geographically and by product category. After you have done that, consult census figures to find the average amount spent on your product category per household. Then multiply that amount by the number of households in your market area to find out how

What's in a name? A royalty

READER'S PLATFORM

JAMES SMITH

Computers now reach into virtually every corner of our lives — from birth through death. It's comforting to know that our life is recorded somewhere; at least the computer won't forget. Obviously, much of this information is extremely valuable in the causes of saving lives, paying taxes and so on. Nonetheless, somehow without "big brother" watching, much of the data is available for a price. Maybe it's that time that we as individuals say, "I want data on myself or family left confidential — it's not for sale."

Or here's another idea! All firms that want data have to contact the intended individuals, ask

permission, and pay the source.

Most of us dislike the annoying telephone calls requesting permission to buy this stock, time-share or even gold mine but getting paid could make them a little more tolerable (still not buyable but at least tolerable).

If individuals wish their data and their families' data to be used by others, let's have data banks established for just such a reason. We send data to whatever number of data bank firms, and this information is available to other companies for a fee. Then each time our data is used for solicitation, we get paid. "I'm paid." Let's give me a price for this individualized data.

Smith is an information systems professional who resides in Marlboro, Conn.

much money your potential customers are spending in your product category. This number is your denominator. Your numerator is your company's sales.

The resulting equation will tell you how well your company is doing. It will tell you how you're competing and, after a few years, it will tell you whether you are gaining or losing ground against your competitors. Most importantly, it will help your

company decide how it should prepare for the future.

Fromm, president of Buckley & Fromm, an information systems consulting firm in Kansas City, Mo., is conducting a nationwide seminar series sponsored by Search Business Systems and Toshiba on how to build a high-performance company. This piece is adapted from his book, *The Five Commandments of Business and How to Break Them*, published by G. P. Putnam's Sons.

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Pick market decision time

Last time I was at a Pick Systems convention, it reminded me of an EST seminar: True believers wandered around the floor repeating, "Pick is good. Pick is swell. Pick will run my business well."

Unlike former EST guru Werner Erhard and some other cult leaders, Dick Pick has not been involved in FBI, IRS or other investigations. What he and his business applications software do have, however, is a flock of faithful followers.

The applications have been around for more than 20 years, mostly running on the Pick operating system. Yet, while almost every other computer business is heading toward applications based on open systems platforms, Pick is, well, still Pick. Not only are its followers still following, but it is gaining new vendor subscribers as some open systems vendors have decided to put Pick applications on top of the Unix operating system.

Just in the last month, Sequent Computer Systems and General Automation have announced excursions into the Pick/Unix market, with Pick applications layered on top of the Unix operating system. Traditional suppliers of Pick, such as McDonnell Douglas Systems Integration and Ultimate, are likely to be vulnerable to deep-pocketed marketing organizations like Sequent, which sells multiprocessing computers

Continued on page 33

BY MARYFRAN JOHNSON
CR STAFF

MAYNARD, Mass. — With more than a little help from its third-party friends, Digital Equipment Corp. last week hauled the highly specialized field of voice applications onto its own general-purpose VAX/VMS computing platform.

DEC unveiled two software company alliances with VoiceSoft Corp. and Audiotechs, Inc., which are crucial to its plans to pitch a variety of voice applications to businesses with complex computer networks. The company also jizzed up its Decvoice system for voice processing with new features, including the ability

ty to handle eight channels per module instead of one and to run on VAX 4000 client/server systems as well as Microvax 3000 microcomputers.

"It will take time for DEC to come up to speed, but there is still an awful lot of open ground here," said Albert Lill, a telecommunications analyst at Gartner Group, Inc. in Stamford, Conn. "This is the perfect strategy for them."

DEC will sell and support the Voicesoft voice-mail and call processing applications, making them an integral part of its All-In-1 Phase II networked office computing applications by 1992.

"It is clear that voice is a form of information, and you can man-

DET. relied on third-party deals in putting together its Decnoise package

A family of voice mail and messaging software products from Voicemails Corp. in Rocklin, Calif.

New software tools for developing audiotext voice applications — such as "talking Yellow Pages" or voice information services for newspapers — from Audiotechs, Inc. in Newton, Mass.

Release 2.0 of Computer Associates International, Inc.'s voice applications development tool, CA-DB: Expert/Voice, which is currently in beta testing.

CW Chang, Dattin St. John

age it on general-purpose computer platforms," said Martin F. Parker, president of Voicesoft. He stressed that users can use Voicesoft's applications without changing desktop devices.

The veterinary medical teaching hospital at the University of California at Davis recently installed a VAX 4000 Model 300 with the Decvoice system, running Vicesoft voice mail. Hospital ad-

The news that DEC had rolled out a host of expanded capabilities in voice processing left a bitter taste in Warren Campbell's mouth last week.

As information systems director at the Better Business Bureau of Eastern Pennsylvania in Philadelphia, Campbell has been struggling for weeks to get Multiline Devcoise working properly on his new, \$82,000 VAX 4000 server.

In the process, he has written twice to DEC President Kenneth H. Olsen, held numerous meetings with sales managers and done enough wheel spinning to grind a furrow in concrete.

"This has been a comedy of errors on their part," Campbell said. "We never knew we were going to be a field test. This was sold to us as a product shipping."

DEC's side of the story is that Campbell signed a letter acknowledging he was getting a prereleased product, but Campbell said he signed the letter as a last-ditch effort to get the system delivered. It was due in January but ar-

ripped in late March.

DEC also contends Campbell should have understood that field service personnel would not be fully trained yet nor able to provide complete documentation for Decvace on the VAX 4000. The original Decvace product, introduced in 1988, ran on Microvax II systems.

The bureau's plan was to set up an automated voice response system that would greet the caller, who would punch in the telephone number of the business in question. The system would access an in-house database for the information.

"We can't understand why this has been so much trouble," Campbell said.

Neither can DEC. "This is not the way we want to do business," said Carol Palmer, voice segment business manager at DEC. "We have tried to be very accommodating with this customer, and it is unfortunate this happened."

"I just want a machine that works without all the hassle," Campbell said. "Thank God we leased it."

MARYFRAN JOHNSON

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The Usual Limits Don't Apply™

SOFT NOTES

Informix
certified

Informix Software, Inc. recently claimed that its Informix Online is the first Unix-based relational database management system to win full certification from the National Institute of Standards and Technology's (NIST) FIPS-127-1 standard for SQL databases. The NIST standard is a subset of the American National Standards Institute's SQL standard.

IBM and Knowledgeware, Inc. have signed an agreement under which IBM will sell Knowledgeware's three host-based computer-aided software engineering products: Application Development Workbench/MVS, Information Engineering Workbench/Mainframe and ADW/Repository Enablement Facility.

Bell Atlantic Business Systems Service in Fraser, Pa., and The Parnac Group in Westminister, Colo., recently said they are offering integrated product support for 20 applications, languages and utilities running on Digital Equipment Corp. VAX systems as an extension of Bell Atlantic's Dextra Support Program. The layered program includes a toll-free telephone line through which Bell Atlantic technicians can offer assistance or initiate more in-depth assistance.

Software vendor Hogan Systems, Inc. recently signed an agreement to market Banca Corp.'s Power 1 commercial credit and lending system for financial institutions. Hogan will sell the system to clients in the U.S. and will provide baseline support. Dallas-based Banca will continue to provide maintenance and message development.

Parnacoft Corp. in Pasadena, Calif., recently said it signed an agreement with Ncube Corp. in Belmont, Calif., under which Ncube will ship Parnacoft's parallel processing tools Performance Monitor and Node Debugger with Ncube 2 supercomputers.

Planning is key at reserve bank

Preparing for disaster recovery is part of day-to-day life at New York Fed

BY JOHANNA AMBRISIO
CI/STAFF

At the Federal Reserve Bank of New York, the week of Sept. 29, 1987, will forever be remembered as a nightmare come to life. That week, the computer that runs the Fedwire funds-transfer system crashed twice in two days.

Since then, thanks to a plan that the New York Fed has implemented to increase its fault-tolerant and disaster-recovery capabilities, no other experience has been quite so unnerving. The bank went kept running throughout a nearly week-long blackout in August 1990, although it had to move to its hot site nearly 40 miles away.

During a recent IBM financial services conference in Albuquerque, N.M., Israel Sendorvic, executive vice president at the New York Fed, outlined the bank's transition from a setup that crashed too often for comfort to one with its affairs much more firmly under control.

As one of a dozen reserve banks in the U.S., the New York Fed moves about \$1 billion from Fed over its portion of the nationwide Fedwire system. Fedwire is the country's primary mechanism through which commercial and other banks transfer funds and securities. The New

York Fed moves about 30% of Fedwire's total funds volume and about 75% of the total securities volume, Sendorvic said. This requires 150,000 transactions each day.

Fedwire runs on one of the New York Fed's three IBM System/370 series mainframes in the bank's New York data center. The second mainframe is used for all non-Fedwire bank business, and the third resides at the hot site in Pearl River, N.Y.

Given the importance of Fedwire to the country's financial well-being, it was no small matter when the system crashed twice that week in 1987. Not only did the New York bank go down, but all the banks with which it did business found themselves ignorant of their exact financial positions.

On Sept. 30, 1987, the night of the second IMS database crash, "hordes of IBMers were at the bank," Sendorvic recalled. "The database was corrupted, and we closed that night at 3:45 a.m."

Although the bank did recover from these crashes, Sendorvic said, that week prompted some

of his colleagues at the bank to question his approach to providing 100% availability. Since about 1986, the bank had been trying to decide on the best method for ensuring no downtime. One faction argued that it would be best to start from scratch and redesign Fedwire on fault-tolerant hardware.

However, Sendorvic did not like that idea. "We didn't need fault-tolerant hardware because hardware is the component that crashes least often," he said. "We needed a fault-tolerant system, and this includes everything—environmental software, people, procedures and utilities." Sendorvic's philosophy, and the one that ultimately prevailed, was to slowly build up fault-tolerant capabilities throughout the bank's information processing network.

His approach has apparently worked. The New York Fed improved its fault-tolerance rating from 97.2% in 1987 to 99.98% in 1990, although the recent figure does not include 2½ hours downtime from the blackout.

To get to this point, the bank focused on educating both man-

agement and users, identifying the single points of failure and buying backups of certain items, such as network controllers. It also automated the operations side as much as possible.

Further, Sendorvic said, seven of the nine crashes in 1987 were caused at least partly because the bank was behind in its software releases—especially in the MVS operating system and IMS. Now, the bank makes it a point to test the most recent releases within six months of their availability. Maintenance changes and updates are made only once per month and tested both individually and as a group before being put on-line.

The bank has also implemented IBM's Extended Recovery Facility, which automatically switches applications to one mainframe to a connected mainframe in the event of a failure.

The New York Fed also reduced the amount of time it needed to recover at the hot site from six hours to one. The Fedwire database is re-created and sent four times each day to the hot-site facility.

All this paid off during the blackout last August, when one of the bank's generators failed. After getting the OK to go ahead with the hot site, Sendorvic said, his team had everything running in less than an hour.

"I was very grateful that things worked like we said they would," Sendorvic said. "But if the week in 1987 was a 10 on a scale from one to 10, the blackout was a minus two."



New York Fed's Sendorvic aims for 100% uptime

Unisys begins building
on OLTP architectureBY ELLIS BUCKER
CI/STAFF

BLUE BELL, Pa. — Last October, when Unisys Corp. issued its systems architecture blueprint, it said a major pillar of the scheme — as well as the company's future — would be on-line transaction processing (OLTP).

Two weeks ago, Unisys unveiled the first pieces of furniture for this OLTP house, announcing new processors and software products, including an enhanced version of AT&T's Unix transaction monitor, to support or transform Unix/OLTP offering.

The three new systems — U 6000/65, U 6000/75 and U 6000/85 — use the Intel Corp. i486 microprocessor, run AT&T Unix System V Release 4 and are binary compatible with existing U6000 machines introduced in 1988.

The high-end U 6000/85, like the U 6000/75, is built by Sequent Computer Systems, Inc., can have up to 30 proces-

sors and supports 1,000 users.

Unisys officials deflected the idea that powerful Unix servers, which can run the same fourth-generation languages (4GL) as Unisys mainframes, would become an inevitable migration path for mainframe customers. They emphasized that the client/server architecture outlined in October calls for three tiers, the top being the "information hub," typically a mainframe.

Analysts see things a bit differently, however.

"In the long run, Unisys is hoping for [migration]," said David Card, director of systems research at International Data Corp. in Framingham, Mass., who praised Unisys for doing a good job of adding features to its mainframes to keep them above the Unix line.

John Duakle, president of Workgroup Technologies, Inc. in Hampton, N.H., said Unisys is traveling, albeit more slowly, along the path already trod by NCR Corp. "They're faced with trying to standardize on a

single architecture," he said.

At the same time, some Unisys users sided with their vendor. "Today, you don't run mainframe applications as you did 10 years ago," said Ernst & Young's national director of MIS, George J. Germann.

In Germann's shop, a network of about 1,500 Unisys personal computers work on Novell, Inc. networks; the corporate mainframe in Lyndhurst, N.J., nightly grabs the data from the networks for processing. "We see the corporate mainframe holding the 4GL, with the transaction processing distributed."

Making Unix handy enough for OLTP, and eventually for distributed OLTP, was clearly a top priority for Unisys. Unisys' answer was an enhanced version of AT&T's Tuxedo Transaction Monitor and it called the industry's first OLTP database to use the XA protocol. The protocol, from X/Open Consortium Ltd., specifies a standard interface between the transaction monitor and multiple distributed database management systems in an OLTP setting.

Unisys and Mento Park, Calif.-based Informix Software, Inc., said the result of their joint effort would be an XA-compliant version of Informix Online.

The three additions to the Unisys U 6000 line are all multi-processor systems, the first four of the line. They are priced between \$36,000 and \$214,000.

One of Unisys' largest U 6000 users, K Mart Corp., plans to upgrade its platform to the multiprocessor systems as soon as

TODAY, YOU don't run mainframe applications as you did 10 years ago."

GEORGE J. GERMAN
ERNST & YOUNG

possible. Two years ago, the Troy, Mich., retailer signed up for what was then the top-of-the-line Unisys Unix box, the i486-based U 6000/60.

"We will upgrade to the 65s over the next year or so, and by the end of '91 will have 800 machines in," said David M. Carlson, senior vice president of corporate information systems.

Carlson said the upgrade means the systems will be able to use high-speed processors as they are needed.

Uniface serves up A la Carte query product

BY JEAN S. BOZMAN
OF STAFF

ALAMEDA, Calif. — Uniface Corp. is allowing end users to take home a side order of its database-server application development system with a client-oriented query product called A la Carte.

The front-end report writer, introduced recently, gives users the option of substituting a what-you-see-is-what-you-get environment of pop-up menus under Open Software Foundation's Motif interface for a character-based Uniface interface designed by corporate information systems programmers.

It supports the same relational database management system products as the standard Uniface applications development programming package. The existing Uniface supports RDBMS packages including those from Oracle Corp., Sybase, Inc. and Ask Computer Systems, Inc.

Uniface, a 4-year-old Amsterdam-based firm, has 175 employees, 30 of them in the U.S.

Cost cutting

Copies of A la Carte may run against remote copies of Uniface software running on remote data servers. However, users

must still have access to at least one system running Uniface's layered fourth-generation language software.

"As long as you go through a Uniface data dictionary on the remote machine, you don't have to have Uniface on the client machine," said Ann Shukla, Uniface's vice president of marketing. Thus, start-up costs for existing Uniface customers would be substantially less than for new A la Carte users, who would need to buy some Uniface products.

One Uniface customer said he planned to integrate the A la Carte package with an existing Uniface applications generator and a Sybase RDBMS. "This will allow

me to design end-user applications that run against multiple RDBMSs," said Larry Laux, president of Milwaukee-based MCSS, Inc., which sells Hewlett-Packard Co.-based data servers to systems vendors to track customer support and maintenance services.

A la Carte menu

A la Carte runs under MS-DOS, OS/2, Digital Equipment Corp.'s VMS and Ultrix, Stratus Computer, Inc.'s VOS and various versions of Unix. Future releases may support other operating systems, Shukla said.

Prices for the reporting tool range from \$800 for an MS-DOS desktop version to \$40,000 for a DEC Vaxcluster version, she said.

Imaging goes to press for start-up

BY CAROL HILDEBRAND
OF STAFF

HUDSON, N.H. — Deciding that market opportunity beats out a slingshot, David joined hands with Goltish in the press industry.

The tiny firm, Prestek, Inc., has signed a 20-year licensing agreement with Heidelberg Druckmaschinen A.G., the largest manufacturer of printing presses worldwide, for Prestek's direct-to-plate imaging technology.

The proprietary technology takes the bit-mapped image of an electronically composed Adobe Systems, Inc. Postscript-produced page and images it directly onto special waterless plates on a printing press. This results in plates that are already aligned and in register, eliminating costly press preparation time. It also eliminates many of the intermediate steps necessary to produce color plates in conventional printing and electronically adjustable ink keys.

Prestek's imaging technology will be incorporated into Heidelberg's GTO line of presses, with the first, the GTO-III, aimed at exploiting the short-run color printing market.

According to Frank Romano, editor of "Typeworld," a newsletter on electronic publishing, there is a void of cost-effective answers for people seeking between 500 and 5,000 copies of a brochure, for example. "Conventional printers want you to do 10,000 or more, and color copiers are limited in quality and speed," he said. He estimated that 65% of electronically formatted pages fall into this category.

Romano also said he expects a lot of switching from black and white as a result of the direct-to-plate imaging. "It allows them to get color at almost black-and-white rates," he said. "It's a whole hidden market out there."

However, some industry observers said Prestek needs to do some fine-tuning. Peter Dyson, editor of "The Seybold Report on Publishing Systems," questioned the amount of time it takes — 20 minutes — to image a plate on the press. With press time an expensive commodity, "you might be better off taking the hit on the setup time," he said, referring to the steps needed to prepare conventional printing plates. "What Prestek needs to do is cut down on the amount of time it takes to burn a plate," he said.

Are Your DBAs Being F



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NEW DEALS

DEC sells to Asian firm

Digital Equipment Corp. sold a VAX 9000 to South Korean securities firm Dongnam Securities Co., its sixth mainframe sale to an Asian firm. Combined with a fault-tolerant VAXt system, Decserver terminals and other DEC products, the contract is worth \$3 million. The VAX 9000 Model 210 will handle Dongnam's customer accounts, investment information, integrated branch management network and trading and portfolio management systems.

Hitachi Data Systems Corp. won an EX 90 mainframe contract from the Port of Singapore Authority. The authority will upgrade from a Hitachi EX 50. The mainframe, the largest commercial processor in Singapore, will accom-

modate the growing Portnet system, which is expected to link 876 users and 1,290 personal computers by year's end.

Amex Canada, a division of American Express International, licensed \$2 million worth of integrated banking applications from Hogan Systems, Inc. The system will allow Amex Canada to begin offering banking services to its 2 million merchant customers this year. Hogan also announced software license agreements totaling \$4.25 million with four international financial institutions.

Cray Research, Inc. sold a Y-MP2E research supercomputer to Netherlands service bureau Informatica Centrum Voor Infrastructuur en Milieu. The bureau will use the Cray for monitoring and forecasting the effects of transportation on the environment and analyzing and predicting changes in waterways and coastlines.

HP updates its MPE/XL

BY J. A. SAVAGE
CW STAFF

CUPERTINO, Calif. — Hewlett-Packard Co. will continue to enhance its proprietary operating systems with 25 additions to be announced at the end of next month. MPE/XL Release 3.0 adds functions for systems management, database management and client/server services, according to the company.

In systems management, HP will add seven enhancements, including management through Openview on either personal computers or an HP 3000 minicomputer monitor. "Anyone on a network can open up a console window," said Richard Serick, general manager at HP's Commercial Systems Division. Also included will be recovery software that will switch users to another HP 3000 system while recovering user data.

In database management, the new operating system will add five enhancements, including connections with its database, Allbase/SQL, and development tools such as those from Ingres Corp. and Information Builders, Inc.

Finally, MPE/XL 3.0 client/server enhancements include support of X Window System and will allow migration from PC-based servers by supporting Novell, Inc.'s Portable Network.

Savage

CONTINUED FROM PAGE 27

based on Intel's 80386 and 1486 architecture. Still, it's not much of a future market on which vendors can hang their profits and not much of a future applications growth path for users, either.

Still, it's one thing to preach to the choir and another to convert disbelievers. Sequent believes it can increase its business 15% by adding Pick applications, and at least one analyst organization concurs. Gartner Group/Infocorp says the Pick market will more than double in the next few years, from \$1.63 billion to \$3.4 billion by 1994.

Stop me if I'm wrong, but I don't think that many college graduates are leaving with Pick experience. In addition, how many salespeople have the background to sell Pick? Sequent officials acknowledge that they have to take Unix people and train them.

While I don't doubt that Pick facilitates database management and some business applications, it seems to be scattering the focus of new users. Just when Unix applications appear to be the thing on which to concentrate, a few vendors are throwing Pick/Unix at users. Perhaps once Unix settles down into one or two or three basic strains (AT&T System V Version 4 and the Open Software Foundation's OSF/1), then it will be time to confuse users with Pick on top of it all. But until then, vendors should spend their time getting their Unix act together. Users have been waiting entirely too long for it.

Savage is a Computerworld West Coast senior correspondent.

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Vice President
Director, Information Systems
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Mark Quinlan
Senior Programmer/Analyst
Huntington National Bank



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Mass Mutual Life Insurance



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Paul R. Hessinger
Chief Technology Officer
Computer Task Group



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John F. Mott
President
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Giorgio Sorani
Division Head - MIS
Lubrizol



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Wai Budzynski
Head of Operations, Systems/Computing
Rolls-Royce



"We used the IEF to rebuild our aging Frequent Flight Bonus system. With DB2 tables of up to 52 million rows, we needed high performance. And we got it...98% of our transactions complete in less than 3 seconds."

Cloene Goldsborough
Director of Data Resource Management
TWA



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Mogens Soransen
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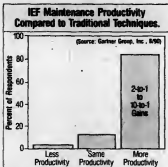
The quality of IEF-developed systems is remarkable. In recent CASE research by The Gartner Group, application developers were asked to report the number of abends they had experienced. (An "abend" is a system failure or "lock-up" caused by code defects.) IEF developers reported zero defects—not one abend had occurred in IEF-generated code.

Maintenance productivity gains of up to 10-to-1.

In this same study, developers were asked to compare IEF maintenance productivity with their former methods. Of those responding, more than 80 percent had experienced gains of from 2-to-1 to 10-to-1. (See chart.)

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Developers were asked to compare IEF maintenance to former methods. Of those responding, more than 80% reported productivity gains of from 2-to-1 to 10-to-1.

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NEW PRODUCTS — SOFTWARE

Development tools

Software AG of North America, Inc. has announced a version of its application generation system that includes object-oriented design techniques.

Natural Construct, Version 3.1 features object-oriented design capabilities that allow several tables or files to be used during the creation and maintenance of complex data structures. Program, statement and model creation elements are also included.

License fees range from \$9,000 to \$77,800, depending on type of platform and operating system.

Software AG
11190 Sunrise Valley Drive
Reston, Va. 22091
(703) 860-5050

Sun Microsystems, Inc. has announced a tool kit that allows users to design what-you-see-is-what-you-get applications that also use Unix System Laboratories, Inc.'s Open Look graphical user interface.

The News Toolkit was designed for creating applications on Unix systems within Sun's Open Windows application development environment.

A user license for the News Toolkit is bundled with all Sun Sparcstations. The product can also be purchased separately

for \$295, including media and documentation.

Sun Microsystems
2550 Garcia Ave.
Mountain View, Calif. 94043
(415) 960-1300

Applications packages

Stalwart System Concepts of Canada, Inc. has announced that its Stalwart Object Administrator software package now runs on IBM Application System/400s.

The product includes user-defined object types, multiple security levels for each user and up to 999 development cycle stages.

The software package is priced at \$14,583.

Stalwart System Concepts
P.O. Box 899
Station J
Calgary, Alberta T2A 6A6
(403) 237-5528

UIS, Inc. has announced Version 2.1 of UIS-Manager (formerly called V-X Manager), its Digital Equipment Corp. VAX data base management system.

UIS-Manager automates user authorization, system reporting and backups. This results in reducing VMS training time and requirements, according to the company.

Version 2.1 offers enhanced VMS monitoring and an upgraded user-defined privilege coding scheme. It also includes DEC's License Management Facility.

Pricing ranges from \$2,600 to \$21,000, depending on system size.

UIS has also announced a new version of UIS-PACS (formerly V-X PACS), a resource accounting and chargeback software package. UIS-PACS Version 2.1 allows incorporation of non-VMS resource data and adds a holiday accounting option and a new-based accounting feature for budget allocation based on resource use.

The product is priced from \$3,400 to \$30,000.

UIS
420 Bedford St.
Lexington, Mass. 02173
(617) 661-6262

HARDWARE

Data storage

Optimem, an Archive Corp. subsidiary company, and Kom, Inc. have announced that 3.9G bytes of write-once-read-many (WORM) optical storage is now available for Digital Equipment Corp. VAX machines.

Kom's Optifile II (\$5,000) software package has been merged with Optimem's 4400 WORM optical disc drive. The 12-in. drive can be installed on DEC VMS-based Q-bus and Unibus machines or on Sun Sparcstation and Sparcserver systems running under SunOS.

Optifile II lets Optimem's 4400 drive be intermixed with other optical drives to provide additional storage capacity.

The bundled package is priced at \$22,300.

Optimem
297 N. Bernardo Ave.
Mountain View, Calif. 94043
(415) 961-1800

Micro Technology, Inc. has announced two Storage Disk Interface-compatible removable storage systems that were designed for Digital Equipment Corp. VAX machines.

The MDI-120R (\$42,000) and MDI-79R (\$24,680) both feature data transfer rates of 2.8M bytes/sec., and both can be configured as dual-drive systems.

The MDI-120R is also equipped with 1.2G bytes of formatted storage capacity, the company said.

The MDI-79R features an average seek time of 20.4 msec and can reportedly generate more than 50 I/Os per second.

Dual-drive versions are priced at \$42,000 and \$72,000, depending on model.

Micro Technology
5065 E. Hunter Ave.
Anaheim, Calif. 92807
(714) 970-0300

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PCs & WORKSTATIONS

COMMENTARY

Richard Pastore

Mixed signals from Compaq



What is Compaq doing in this Advanced Computing Environment (ACE) alliance? Is it favoring RISC over the Intel architecture? Is it gunning for high-powered users over the corporate desktop set? Have thousands of Systempro users bought into the wrong high-end solution? To hear Compaq tell it, the answer is yes and no. Maybe.

One thing is clear, however: Compaq is very serious about ACE and is putting its money and its mouth into the project. Chief Executive Officer Rod Canon stood up in front of hundreds of skeptical reporters and analysts at the announcement and promised it will be the "predominant computing for this decade."

For current Compaq users, the signals are mixed. The vendor says it will remain "strongly committed" to the future Intel product line. But one has to wonder if the old-fashioned Intel 80386 and 1486 will command much of Compaq's attention during the next 18 months.

Case in point: Compaq admits it is getting harder to differentiate the Intel-based desktop PC. The company's accustomed

Continued on page 40

Hollywood to make its VDT screen debut

BY CAROL HILDEBRAND
OF STAFF

Not content with its staid Blue image, IBM went to Tinseltown to find inspiration for its entry into the presentation graphics market.

With Hollywood, a Microsoft Corp. Windows-based package from IBM's Desktop Software Business Unit in Milford, Conn., the company takes aim at such packages as Microsoft's PowerPoint and Aldus Corp.'s Persuasion.

IBM has also acquired the rights to develop a version of OS/2 Presentation Manager from Hollywood's developer, Publishing Solutions, Inc. in Marlboro, Mass.

Variety of methods

Hollywood allows several methods of creating presentations. Users can choose either a pre-designed, customizable template or an integrated outline to put together a project. Text can be imported from word processors and spreadsheets. Hollywood's Data Manager interface features a spreadsheet-like format that allows easy importation of the data and generation of charts and tables.

Sheldon Laube, national director of information and technology at beta-test user Price Waterhouse, said the outlining feature broadened the product's appeal. "It makes it relatively accessible for nongraphics professionals," he said. "You can do simple stuff easily, but it has a tremendous amount of further sophistication as you get in un-

der the covers."

Hollywood supports Speedo scalable fonts from Bitstream, Inc. and features a tool that allows shadowing, curving, mirroring and color washing of the text. It offers a wide array of chart types and a chart gallery in which a user can store frequently used chart types. A toolbox of "drawers" of basic tools for such tasks as entering text, drawing and painting.

Kelley Anderson, a beta-test user at Deloitte & Touche in

Dallas, praised the ease of use for the unsophisticated user. Anderson, who is "not a power user," said, "It's intuitive to use. It comes up, you've got that toolbar, and it's easy to pick the type of activity you want, and you just go in and do it."

Anderson added that he also liked the ability to get into black and white quickly and output a presentation on a laser printer, which, he said, was a problem with other packages.

Laube said he found one

drawback: The package does not install on a network very well. "You pretty much have to have a copy of it on every machine," he said. "It takes up a lot of disk space." Laube added, however, that IBM is presently working on the problem.

Hollywood retails for \$495 and is slated for availability May 31. IBM announced toll-free live technical support for all IBM Desktop Software products. On-line support is available to Compuserve members.

FEATURE: GRAPHICAL USER INTERFACES

Keep them sleek and simple

BY CHRISTINE COMAFORD
SPECIAL TO PC

The fact that a user interface is graphical doesn't automatically mean it's intuitive or easy to use. Consider this: According to Microsoft Corp., becoming accustomed to a graphical user interface (GUI) should require eight hours of training. However, in a study by Corporate Software, Inc., 14 firms reported that 20 to 30 hours of training was a more accurate estimate. Apparently, GUIs are not nearly as intuitive as their creators would like to think.

A "good" graphical user interface is straightforward in its presentation and easy to navigate. It uses its screen real estate well, is succinct and powerful and doesn't include unnecessary components.

A "bad" GUI is awkward, unclear and certainly not intuitive. The user is never sure how to do and never sure how to find his way to a desired action. Some GUIs give the user confidence; others don't.

Computer-fluent developers are often guilty of designing interfaces that are difficult to understand, assuming that users think and interact. To page 40



MAY 1991

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2		4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
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Paradox breaks new ground

While most in the software industry scramble to maintain their status, Borland International, Inc. has used technical acumen and aggressive marketing to grow at a rate reminiscent of the industry's boom years. Last week, the company announced 1991 revenue of \$226.8 million — 100% higher than a year earlier.

In recent years, Borland has claimed that its Quattro Pro spreadsheet has made great strides against entrenched rivals, while sales of language products such as Turbo Pascal, Turbo C and Turbo C++ also continued to soar.

Officials at the Scotts Valley, Calif.-based firm now have high hopes for the upcoming Paradox for Windows, which features a new database engine architecture that allows applications to share data by mapping into a

common "object layer." In the current, character-based version of Paradox, such data exchange now requires traversing the Paradox database.

Microsoft Corp. and Ashton-Tate Corp. have both promised Windows-oriented databases, but the potentially lucrative Windows database market is still relatively untapped and serviced by such products as Superbase 4 from the smaller Precision Software, Inc.

Computerworld Senior Correspondent James Daly recently discussed with Borland Vice President and general manager Rob Dickerson the upcoming product and its importance.

What are the advantages of the new architecture?

Data independence. We want our users to choose the kind of data they want and be consistent

with it. It's the ultimate open architecture. Plus, you're guaranteed that any data the engine maintains reserves the referential and domain integrity of the information.

Will you extend that design to the character-based Paradox?

Nothing technically prevents us, but right now we're maniacally chasing after getting these Windows products out the door. We're not saying you won't see it on DOS, but we're not working on it right now.

Do you think these who use character-based Paradox will feel left behind?

That's going to be a fundamental question during the DOS-to-Windows [transition]. As a vendor, we're always thinking about into which basket we should put our eggs. We've chosen to make Paradox for Windows the killer application, because we see a real opportunity for its users.

Borland has a tradition of announcing and shipping products on the same date. Why the sneak peek?

The biggest complaint we get is that we sometimes play our cards too close to the vest. We want our customers to know what our objectives are. We want to show people where we're going, so developers don't feel they've been abandoned.

Speaking of where you're going, what is the Borland commitment to OS/2?

We focused on Windows before OS/2 because it's more commercially significant near term. We know how to build OS/2 applications — Sidekick OS/2 is bundled with an operating system from IBM — but we're not doing anything stupid in terms of not being able to make Windows applications to OS/2.

With OS/2's future up in the air, does "not doing

anything stupid" mean not doing anything at all for OS/2?

No, we're just not doing anything under Windows that makes the code nonportable to OS/2. But at this time, we are not building Paradox for OS/2.

How about Unix?

We're not building Paradox for Unix right now. We support broad connectivity rather than a cross-platform strategy. Vendors that choose a single-platform focus strategy usually win, because they know how to take advantage of that platform. Compare Borland with Ashton-

Tate, which is building a flavor of Dbase IV for virtually everything that runs on electricity. As a result, they've got so many code bases, it makes it very difficult to evolve the product.

We're building a broad range of applications on a narrower range of platforms.

What are Borland's greatest challenges in the next two or three years?

Winning on Windows. Using the transition to Windows as an opportunity to grab big pieces of market share, and giving customers products the competition doesn't have. Paradox is a big part of that.



Dickerson is pursuing a place in the Windows market.

Intel plans AMD squeeze

BY MAURA J. HARRINGTON
CITY

SANTA CLARA, Calif. — As it has done in the past, Intel Corp. will probably use its marketing muscle to try to neutralize arch-rival Advanced Micro Devices, Inc.'s efforts to market its new AM386 clone microprocessor. Intel is expected to introduce a low-end 1486 chip in a 386 price range this week.

Code-named the P23, Intel's new microprocessor chip will not include a floating-point coprocessor, according to analysts.

Though it will likely be marketed as a higher-end product than AMD's AM386 chip, the P23 would be similar to AMD's new AM386 because both chips would run 32-bit software applications at only slightly different clock speeds, analysts said.

Intel's effort to overshadow AMD's new chip is not in vain, according to semiconductor analyst Millard Phelps at Hambrecht & Quist, Inc., an investment firm in San Francisco.

Some major differences in the components of a 486 chip might make the P23 more attractive than AMD's 40-MHz AM386

clone, if the price/performance ratio is right, Phelps said. Intel was able to place cache memory inside its new chip, for example.

AMD was the first to clone Intel's 80286 microprocessor (in 1985) but took a reduction in profit margins on sales of the 16-bit chip after Intel introduced the 32-bit 80386SX chip, which it priced competitively with AMD's AM286 chip to drive it out of the market.

Semiconductor analyst Michael Slater, publisher of trade journal "The Microprocessor Report," said he agrees that Intel may attempt to tarnish AMD's competitive efforts with its marketing clout and product introduction. However, he said it will not be easy this time for the chip vendor to succeed.

"This is a price/performance issue... where Intel is essentially saying, 'Here's a way to get the same performance on a higher level machine for the same price as the lower level [386 chip]," Slater said.

He added that Intel will probably sell its low-end 1486SX-type product for just slightly more than the Intel 386 chip costs.

Object of the game

While Borland continues to gain accolades and market momentum with its dizzying release schedule, there remains an unused hero of the firm: object-oriented programming.

Chief Executive Officer Philippe Kahn is betting the company on the methodology, a visually oriented programming technique that slashes development time by supplementing rigid programming designs and commands with graphical icons.

Since Borland switched to an all object-oriented development program more than two years ago, the firm's release schedule has been the envy of the industry. It was object-oriented programming, after all, that allowed the release of the Quattro Pro Version 3.0 spreadsheet only five months after the product's previous edition.

Object-oriented technology also played a key role in the development of the upcoming Paradox for Windows. "If we didn't use object-oriented technology, the program would take more than 100 engineers to build, and that's unmanageable," Kahn said.

The increasing complexity of writing software will require firms to standardize on object-oriented programming, he added.

JAMES DALY



Borland's Kahn emphasizes object-oriented tools.

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Sleek and simple

CONTINUED FROM PAGE 37

with computers the same way they do. They are often quite unaware of how much prior knowledge goes into their understanding of what appears on the screen and are unable to grasp the requirements of users who lack that background. This is frequently compounded by failure to solicit user feedback or get help from human factors specialists.

The current definition of IBM's Common User Access (CUA) is quite limited and rarely helpful when designing and predicting how users will interact with software. In response, a growing number of applications are using "user-centered" interface components such as status and tool bars, utility "ribbons" and file caches. The more users embrace these new interface components, the more they become de facto standards.

Because of such emerging standards, it is critical for developers to keep up with new GUI applications. Observe them objectively — try, if you can, to mimic the mind-set of the naive end user. What functions can you use and understand before picking up the manual or asking questions? Try to apply the most successful structures to your software's tasks. This is not a question of copying the look and feel of a competitive product, but of applying successful design principles to your own work.

• **Know your users.** Build on paradigms users encounter in their daily life and thus are familiar with. Test the icons you are thinking of using. Find out if most users understand that the little striped square shape represents an open book.

Don't assume that users are like you. Have someone sit in front of your application and try to figure out how to interact with it. Be humble enough to gauge how

easy how the users react and solicit their input for making interface changes. Provide default options in all fields and make sure sufficient attention is given to context-sensitive help.

Users rarely fall into one broad class. Assume they will fall into a number of categories and allow the interface to be understandable. GUI design for general-purpose corporate applications should be based on three categories of users:

1. Data entry/transformation processing. These applications should be geared toward high-turnover staff and must re-

GUI guide

The following are the eight essential steps to designing an easy-to-use GUI:

- Know your users.
- Make frequent tasks easy.
- Adapt to users' work patterns.
- Consider multiple skill levels.
- Provide navigation help.
- Be consistent.
- Don't rely on users reading the manual.
- Don't get too cute.

quire minimal training. They will be keyboard-intensive, so you should provide menu accelerators and expect minimal, if any, use of mice.

2. Decision support. These should be geared toward personnel with minimal time for training. They will be mouse-intensive, but don't overlook keyboard-intensive laptop use.

3. Systems administration. These should be geared toward technical staff who need more information for operating system, network and database management system administration. They will

use both mice and keyboards.

• **Make the things done most frequently the easiest.** Actions performed most often should require a minimal number of keystrokes, and menu selections should be at or near the top of the menu hierarchy. For example, changing character attributes in a word processor is common. Don't make users go through multiple menu levels for something so basic.

• **Adapt the interface to users' work patterns.** The interface should be customizable at some level. A good example of this is the ability to add menu items to Microsoft's Word for Windows by using macros. This idea is very powerful in light of the need to know your users. A corporation's end-user computing group could provide custom menus for each user category.

• **Consider multiple skill levels.** Both occasional and sophisticated users should be accommodated. Provide an option to display advanced features if desired by the user. A good example of this is Word for Windows Long Menu option. This feature enables power users to work at their own speed and does not confuse inexperienced users by displaying too many choices that they wouldn't need anyway.

• **Provide navigation assistance.** It is essential to design GUI applications with the end user in mind, to avoid providing too many options at the highest level and causing user paralysis. Grouping related menu items together also significantly reduces navigation confusion. Avoid menu items which a user's actions will be restricted or worse yet, in which the user will have to figure out how to return to the default state of the application.

• **Be consistent.** CUA emphasizes consistency over clarity and ease of use. Follow the basics of CUA in order to be consistent with shrink-wrapped products, but when in doubt, opt for clarity and us-

ability. In menus and on buttons, use words that are common in the industry (File, Edit, Help and so on) or are understood and accepted within your firm.

Don't overlook formally designing the interface and having users review it before starting to code. Audit your interface design against either in-house or shrink-wrapped applications. Is it consistent? It should look and feel like other CUA-compliant applications, or it will require additional user training and may not integrate well with other applications.

Don't require the user to refer to a manual. Basic functionality of the application should be easily understood. Display as much of the application's functionality as possible without cluttering the screen. Tool bars and utility "ribbons" are helpful in graphically portraying product features, assuming the icons are properly designed.

• **Don't get too cute.** Use graphics to provide visual metaphors to give users a familiar operating environment. Avoid the temptation of cluttering limited screen real estate with unnecessary icons, for example. Strive for a "WYSIWYTS" interface — what you see is what you need to see — nothing more, nothing less.

Tomorrow's users will be increasingly more sophisticated and demanding. To design successful GUIs, developers need to just that — really design them. That's not always easy, and chances are good that you will have to make trade-offs, given the fast-paced world of software development. But bear in mind that the benefits of doing it cleanly the first time will show up — fast.

Alex Ward, senior technical consultant at Keweenaw Associates, Inc., contributed to this article.

Continued in a partner in Keweenaw Associates, Inc., with offices in Redmond, Wash., and San Jose, Calif.

Pastore

CONTINUED FROM PAGE 37

high profit margins depend on differentiation. The last thing it wants to do is peddle commodity boxes. So the PC maker is turning the sexy, underappreciated world of RISC and is apparently concentrating a great deal of development effort there.

Indeed, chief engineer Gary Stinac has been cloistered away for several months on this project. Other than the notebook LTE 386S/20, what exciting Intel product has come out of Compaq dur-

ing that time?

The Houston PC maker certainly isn't planning to dump the corporate market in favor of partner Silicon Graphics' scientific and engineering user base. The bucks and the volume still lie in the corporate environment.

Apparently, Compaq thinks high-end corporate users are increasingly fixated on the possibilities of RISC architecture. They perceive RISC as a faster, more robust architecture and development platform, according to Lorin Strong, Compaq's vice president of marketing. Compaq is doing ACP partly based on that perception, she said.

In actuality, the Compaq brain trust says it expects Intel and the MIPS Computer Systems' RISC chip to sear as the dominant power platform. The firm will offer dual architectures until one earns market dominance.

So, how is a user supposed to determine which architecture to buy from Compaq in 1992?

Compaq says it is not sure who would buy which architecture for what purpose. But presumably, users doing higher end, mission-critical work would opt for RISC — based on that perception of power superiority.

What then of Compaq's current high-end strategy: multiprocessor systems? Is the Systempro a dead end on the high end? Or was it intended only as a network server, despite Compaq's earlier claims that it could replace minicomputers?

Once more, Compaq says it is not sure of the fate of the Systempro. "If users are putting higher end applications on the network, we think they will be looking for more than two processors and greater storage," said Michael Clark, a Compaq engineering vice president.

The company is considering expanding the Systempro beyond the two-processor limit or building a Systempro-like box around future RISC processors. In any case, the Systempro as it now stands apparently will not be the answer after 1992.

One more thing Compaq says it is not sure of is distribution for the new RISC

systems. Many Systempro customers are already unhappy about having to buy mission-critical systems from traditional PC dealers, and even more are unhappy with the service the dealers provide. Users are quite unlikely to accept a whole new advanced RISC platform from the friendly neighborhood Businessland store.

APPARENTLY, COMPAQ THINKS high-end corporate users are increasingly fixated on the possibilities of RISC architecture.

Compaq's new bedfellow, DEC, sells its RISC workstations directly. New partner Silicon Graphics sells its workstations directly. The PC maker has some obvious examples to follow if it chooses to do so. Indeed, the agreement with Silicon Graphics does not preclude it from distributing Compaq's products, according to Clark.

The next two years will tell Compaq customers what they will be able to buy and where they will be able to buy it. But why they should buy may be the toughest question to answer.

Pastore is a Compaqworldwide senior writer.

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R:Base 3.1 feature-filled but lacks speed

Microrim, Inc.'s R:Base Version 3.1

Reviews	Ease of use	Data integrity	Multitask support	Performance	Application development	System installation	Service & support	Value	Score
Editorial 1/14/91	Very good	Good	Satisfactory	Poor	Very good	Very good	Satisfactory	Good	Great build, but slow
PC Week 12/16/90	Satisfactory	Good	Good	Satisfactory	Satisfactory	NC	NC	NC	First integrity
PC Computing 2/91	Excellent	NC	A through	Poor	NC	Good	NC	Good	A commander
Users									
Jim Shandy, Superior National Insurance Co.	NC								Nothing can touch it
Bill Chaff, Phoenix Locky Group									Needs more speed
Charles Brown, CB Commercial									Personal services
Analysts									
David Stone, D.L. Miller & Associates									Fair
Jerry Caron, Finance Microcomputer Reports									Good
Paul Usman, Database Advisor									Solid, mature

Reviewer evaluations are excerpts from articles. Refer to actual reviews for details. User and analyst ratings are based on telephone survey. NC: No comment. Key: Very good, Good, Fair, Poor

Technology Analysis — A roundup of expert opinions about new products. Summary written by staff writer Derek Slater.

Reviewers said Microrim's R:Base database management system is for sedan drivers: Its low-octane performance will frustrate speed lovers, but it is laden with numerous features for querying, reporting and development.

Version 3.1 corrects a number of rough edges and performance problems that plagued R:Base 3.0, and Microrim offers free upgrades to registered users of that release.

Ease of use: R:Base is a user-friendly program, reviewers said. Queries and browser menus make data easily accessible. Users can operate either through menus or with a command line. A prompt-by-example function demonstrates the correct way to build commands. **PC/Computing** reported that Version 3.1 also handles printer problems more gracefully than its predecessor, warning the user instead of freezing the system. The installation procedure has been simplified and takes only 15 minutes, reviewers said.

Data integrity: Referential integrity in a multiple-table database is enforced by rules written specifically into that database rather than in the controlling code. As a result, reference rules can be very specifically customized. R:Base stands above its competitors in this area, according to **PC Week**.

Multitask support: R:Base offers good multitask features overall, reviewers found. However, there are a few notable limitations. All locking is at the table level; individual records cannot be locked. Users trying to view a locked table are sent to a wait queue, which aborts after a user-defined interval if the table does not become available.

Performance: Lack of speed is the foremost drawback for R:Base users.

Vendor financial information

A 5-year-old company, Microrim, Inc. produces only the R:Base product line. Based in Bellevue, Wash., the company has 135 employees. It is run by CEO Jack Noonan, formerly at IBM, and by Founder and Chairman Charles Brown. The privately held company does not release financial data. Sales are reportedly in the \$50 million to \$25 million range.

The program struggled in well behind other databases in benchmark tests conducted by personal computer laboratories. However, as analyst Jeremiah Caron commented, "Its performance is poor relative to the others, but you don't have to sit around tapping your fingers."

On the plus side, Version 3.1 is streamlined down, running in as little as 450K bytes of memory.

Applications development: R:Base's powerful programming language and numerous tools provide an

excellent development environment. SQL commands can be integrated into R:Base applications, and a compiler is included. The debugging tools and editor are less impressive but still useful, according to reviewers.

Documentation: For Release 3.1, the documentation is reworked, including updated indexes. The manuals are thorough and clear. One manual explains the similarities and differences between R:Base and Ashton-Tate Corp.'s dBase. R:Base has on-line Help as well.

Service and support: Support policies were recently revised. Microrim now offers several support options. Phone support, while still free, is no longer toll-free for all users. Technical information is still available for no charge through a bulletin board service and a fax program.

Reviewers found the phone support technicians to be fairly easy to reach and very knowledgeable.

Value: Reviewers said R:Base, priced at \$795, is a good value overall; it is best suited for users willing to sacrifice some speed for powerful features.

Microrim recently announced a new upgrade plan for R:Base called Upgrade Express. Users who enroll for a fee of \$129 per year (999 before April 30) will receive periodic enhancements throughout the year. The first Express extension includes a feature called the Dynamic Application Integrator, which gives users the ability to menu and run other applications (such as spreadsheets) from within R:Base.

A low-end version called Personal R:Base, without programmability and network support, is available for \$99.

Microrim responds

Comments from Mickey Friedman, director of product marketing:

Performance: We have concentrated our performance enhancement efforts where our users need them most: queries by example, for instance. Upgrades will continue to enhance performance.

Service and support: Our purpose in changing support policies was to satisfy a broader range of needs. We offer three levels of service. The first level is free support to all R:Base users. Second is higher priority for \$99; that includes a toll-free number, faster response time and our "R:Base Exchange" publication. The third level is consulting on application development, which costs either \$2 per minute or \$20 per call; or there is a value pack of 10 calls for \$149. This offers a level for any need or budget.

Value: Each release in Upgrade Express will be significant. There will be three upgrades per year, and we have general guidelines to follow for outlining quality updates, performance enhancements and so on.

NEXT WEEK

► **Dataspace International, Inc.'s Dataspace 4.2** offers no procedural programming language. Instead, the company emphasizes ease of use.



"AFTER FIVE YEARS of development and use, we remain convinced that no other environment could give us the capabilities provided by R:Base."

James A. Shandy
Vice President, MIS
Superior National Insurance Co.

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S. 76

Three HP Apollo RISC workstations are displayed in front of the large number '76'. Each workstation consists of a monitor and a keyboard. The leftmost monitor shows a logo with the letter 'A'. The middle monitor is dark. The rightmost monitor shows a technical drawing of a mechanical part.

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Satellite firm automates sales force

BY ALAN J. RYAN
CHICAGO

PLANO, Texas — Sales can get complicated in Timothy Flynn's business of selling satellite time, especially with a four-person sales team handling 24-hour operations, a tricky pricing strategy and customers who do not like to wait.

Flynn's company, Broadcast Satellite International, Inc. in Plano, buys thousands of hours of satellite time from various carriers and then resells that time in 15-minute increments to news and sports organizations, syndicated businesses and the like.

Flynn was working with various pricing structures because the channels were purchased from several carriers. Because he was dealing with every time zone in the world, he could get calls at any time of the night.

All that has been simplified with software from SBT Corp., which sells an accounting package that includes sales force automation modules.

Flynn purchased Database Executive Library two years ago because it was compatible with his Fox Software, Inc. Foxbase

database. Since then, he has added an on-line sales order program and a contact manager module.

Salespeople can now access data directly from laptops to check on the status of a client, what the client has ordered in the past and contact names at client companies. They can even conduct credit checks.

Pricing benefits

More importantly, however, the company can now more accurately price the satellite time it sells, thus increasing profitability. On the old system, Flynn set one average price for all the channels on the satellite to avoid the complexity of pricing each one separately. His profits varied from channel to channel.

The SBT software allows him to plug in the varying prices for each channel. When the time is sold, the correct price automatically pops up on the screen.

The most important change sales-force automation software has brought about, however, is the ability to more easily maintain 24-hour operations.

"If someone calls in from Japan in the middle of the night and wants to buy satellite time im-

mediately, [an on-call representative] can sell it from home," Flynn says.

The salesperson can also alert customers to the status of the request and immediately give the confirmation number assigned by the satellite carrier.

Broadcast Satellite plans to add fax cards to its Zenith Data Systems laptops so they can close transactions even more quickly. "We are just beginning to see the benefits of that program, and that will be tremendous for us," Flynn said.

HP unveils pocket computer

CORVALLIS, Ore. — Hewlett-Packard Co. will release a calculator-size computer this week, according to sources close to the company.

The 951X will weigh 11 ounces and will come with 512K bytes of random-access memory (ROM) and a slot for flash-memory cards. The ROM will hold Lotus Development Corp.'s Lotus 1-2-3 Version 2.2 and MS-DOS. The 951X will also include a built-in scheduler, memo-taker, address book and HP Ad-

vanced Financial Calculator. It is slated to retail for \$699.

HP will also bundle the machine with an infrared, cableless port, which will allow data transfer between 951Xs.

Sources said HP will also offer 951X users automatic paging via Motorola, Inc.'s Electronic Mail Broadcast to a Roaming Computer technology by the end of 1991. It will include terminal emulation abilities for electronic mail retrieval and file retrieval, but it will not have a built-in modem.

NEW DEALS

Canadian agency enters into PC contract

The Canadian government has purchased a personal computer network contract worth up to \$45 million over three years. The Employment and Immigration Canada bureau is buying 8,000 Acer American Corp. PCs based on the Intel Corp. 80386 chip, as well as 8,000 Acer IBM Video Graphics Array monitors. Systems integrator Mohawk Data Sciences Corp. will supply and install the equipment.

Everett Systems, Inc. was a subcontractor role in the federal government's Department of Veterans' Affairs (VA) Nationwide Office

Automation contract. Everett will supply up to 15,000 Intel Corp. 80386SX and 80386DX-based PCs over six years to contractor Lockheed Integration Solutions Co., which will install the systems in VA agencies.

General Electric Information Services (GEIS) awarded an \$8 million contract earlier this month to Hewlett-Packard Co. for workstations, servers, software development tools, system software and peripherals. GEIS will use the equipment as part of its information services business.

NEW PRODUCTS

Software applications packages

Appix, Inc. has announced Version 1.1 of Asterix, an open suite of applications packages designed for Unix workstations and X terminals.

The product includes word processing, a graphical spreadsheet, audio for voice annotation, color pixel editing and live links to third-party applications. The software also provides fax support via macros and adds interprocess communications capabilities to its extensive language facility. A color pixel editor enables users to edit scanned-in, imported and Asterix-generated images pixel by pixel using a 64-color palette.

The product now runs on Sun Microsystems, Inc.'s Sun3, Hewlett-Packard Co.'s HP 9000 Model 300 workstations and MIPS Computer Systems, Inc.'s RISC System workstations.

The product costs \$995, or \$665 for a version without spreadsheet capability.

Appix
112 Turnpike Road
Westboro, Mass. 01581
(508) 870-0300

Computer Associates International, Inc. has begun shipping Accpac Plus U.S. Payroll Version 6.0, an upgraded payroll processing software package.

The personal computer-based product adds the ability to distribute an employee's payroll expense to several departments in the same pay period. Other enhancements include an updated user interface, multiple time-card reuse capability and a workmen's compensation report.

The product is priced at \$795.

The company said it offers several lower priced options for upgrading from previous versions.

CA
711 Stewart Ave.
Garden City, N.Y. 11530
(516) 227-3300

Software utilities

V Communications, Inc. has announced a Microsoft Corp. Windows 3.0-compatible version of its Intel Corp. 80386/486 DOS memory manager.

Memory Commander (\$100) can reportedly move terminate-and-stay-resident programs and device drivers into high memory while a system is being booted,

thereby creating more main memory for DOS-based applications that contain copious amounts of data.

When necessary, DOS users can break their 640K-byte memory barrier by equipping their environment with up to 900K bytes of contiguous memory, the vendor said.

V Communications
4320 Stevens Creek Blvd.
San Jose, Calif. 95128
(408) 296-4224

Right On, a mouse utility designed by Fanfare Software, enables Microsoft Corp. Windows 3.0 users to create customized sets of button actions for each application they use.

The product allows a mouse's middle and right buttons to be programmed to perform special tasks for use during various applications.

The product costs \$50.

For a limited time, the company is including its screen cursor utility package, Magic Cursor, with Right On for \$79.95.

Magic Cursor requires less than 10K bytes of memory and can be purchased separately for \$49.95.

Fanfare Software
9420 Reseda Blvd.
Northridge, Calif. 91324
(818) 866-8787

Central Point Software, Inc. has announced an antivirus software package designed for DOS, Microsoft Corp.'s Windows and networked environments.

Central Point Antivirus (\$129) detects, eliminates and prevents data corruption caused by more than 400 known and unknown viruses.

A file immunization feature makes executable files self-protecting, and a dialog box alerts Windows users of infections that occur while a Windows application is running.

The product includes Vade, which is a memory-resident utility that monitors systems for signs of a virus attempting to infect a file.

Central Point Software
15220 N.W. Greenbrier
Pkwy.
Beaverton, Ore. 97006
(503) 690-8090

Database management systems

Micro Data Base Systems, Inc. has released M/4 for Windows, a Microsoft Corp. Windows 3.0-compatible database management system.

The product incorporates a data dictionary, an interface for the company's Object/1 graphi-

cal development environment, a Microsoft C application programming interface and development tools.

Available add-ons to M/4 include ad hoc query generation and interactive tools for database access.

The package is listed at \$995. **Micro Data Base Systems**
Two Executive Drive
Lafayette, Ind. 47902
(317) 447-1122

Revelation Technologies, Inc. has announced Version 2.1 of Advanced Revelation, a relational database management system and application development environment for IBM Personal Computer ATs, Personal System/2s and compatibles.

The product's query-by-example feature acts as an intuitive front end for interactive relational queries, and its distributed indexing capability obviates the need for all transactions to pass through a single file, according to the vendor.

Advanced Revelation Version 2.1 lists for \$1,195.

Users of Version 2.0 can upgrade their systems for \$200; all other upgrades cost \$400.

Revelation Technologies
Two Park Ave.
New York, N.Y. 10016
(212) 688-1000

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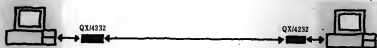
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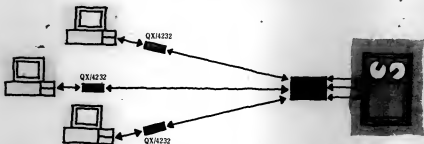
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BIT BLAST Netool licensed

Multiplexer vendor Timesplex, Inc. and Make Systems, Inc. recently announced a worldwide agreement that will allow Timesplex to license a version of Make Systems' Netool decision support system. Netool allows users to preview the ramifications of new network configurations before making equipment and line installation decisions. Make Systems announced the Link version of Netool — along with a version for Newbridge Networks Corp.'s Mainstreet T1 multiplexers and 4602 network management systems — last September. Timesplex and Make Systems are reportedly jointly developing a system for importing network information from Timesplex's Timeview 2000 network management system to Netool.

Anthem Electronics, Inc. recently created a new manufacturing unit to handle existing and undisclosed new networking products. Anthem, based in San Jose, Calif., has an exclusive license to build and sell Novell, Inc. Ethernet adapter cards. The new unit, Eagle Technology, will take responsibility for that line. According to Anthem, which is rumored to be preparing to license Novell's Network ELS work-group software, Eagle will offer unspecified new connectivity products.

Unitas Corp. recently announced a flurry of enhancements to its Network Applications Platform voice processing system, including fax services and voice messaging capabilities. The fax features include a fax mailbox, fax overflow, fax annotation and broadcasting. Voice messaging capabilities include password retrieval, review and storage, paging, group mailboxes and message forwarding.

Alliances get mixed reviews

Banding of telephone companies may aid multinational corporations

BY ELLIS BOOKER
and JOANIE M. WEXLER
CS/STW

In this era of strategic vendor alliances, the world's telecommunications carriers are no exception. Many are banding together to provide one-stop global network shopping to multinational customers with mixed reactions from the user community.

While users agreed that better coordination among the world's carriers is desirable, some said they have yet to be convinced that a carrier partnership will prove faster or more convenient than their seasoned in-house networking staffs.

Bill Coopers, director of telecommunications at Deere & Co. in Moline, Ill., said that because his 11-country network is "not broken," he would be reluctant to hand over its design, planning and management to an independent entity.

Coopers, who is also vice president of the U.S. branch of the International Telecommunications Users Group (Intug), said the Intug jury is still out on the one-stop concept. Today, he explained, eliminating finger pointing in troubleshooting international circuits requires "you to simply sit down with the carriers and figure out whose problem it is."

How much better three or more carriers will do in resolving a customer problem is an open question, he said.

Meanwhile, a multinational carrier alliance is working well for General Electric Co., according to Stanley Weiland, manager of corporate telecommunications at GE. British Telecommunications PLC, AT&T, France Telecom and Japan's long-distance provider, Kokusai Denhin Doorn Co., have been providing a 40-country end-to-end network for GE since the spring of 1989.

Weiland said that for GE, the approach has paid off — particularly in not having to employ telecommunications staff around the world.

"The three carriers know Europe; their relationships with the PTAs are better than ours," he added. "They help us build rapport with the other carriers and define what facilities we need and coordinate a smooth installation of those services."

Day by day

Weiland acknowledged, however, that the arrangement's success hinges on day-to-day involvement by GE. "I'm a great believer in outsourcing, but I'm also a great believer in participation," Weiland said. GE runs a centralized network management base in Princeton, N.J., that interfaces with all the Postal Telephone and Telegraph (PTT) authorities. The firm is involved in the day-to-day troubleshooting of network problems.

"Communications today plays too vital a role to turn the whole thing over and cross your fingers," Weiland said.

Potential partners

THE most recent carrier alliance is a proposed partnership of British Telecommunications PLC, Japan's Nippon Telegraph & Telephone Corp. and Germany's Deutsche Bundespost. While details of the would-be alliance are sketchy, Wolfgang Hueter, a network analyst at the Deutsche Bundespost's Economic Research Institute in Bad Homburg, Germany, explained the impetus behind it.

"Different countries use different protocols and different standard transmission rates," he said. "Most U.S.-based companies don't have enough knowledge of all these nuances to optimize their networks, and it is very complicated and expensive to do all the research."

JOANIE M. WEXLER

Networking could spur DVI technology growth

BY JIM NASH
CS/STW

Proponents of digital video interactive (DVI) have said the multimedia-derived technology is waiting for a spark to set off rapid growth. That spark, they said, will be networking.

DVI, a technology that links audio, still-image, video and data in an interactive database, is already having an impact on employee training and product marketing. The problem is, it is often impractical to set up an entire system — including personal computer and videomonitor or laser disc player — on an employee's desk.

The answer, early implementors of DVI said, is to centralize the data and distribute it over local-area networks. At Bethlehem Steel Corp. in Bethlehem, Pa., plans are under way to network its 18-month-old DVI system. Bethlehem Steel uses the system in an automated help desk and for desktop training.

Leon Murphy, manager of Bethlehem Steel's multimedia

applications team, said that with DVI, company managers are able to provide "just-in-time training," or training available almost as soon as the trainee needs it. But it still requires employees to have the proper

customers on how to use the steel maker's IBM mainframe connectivity application. The software allows users to link their IBM mainframes to Bethlehem Steel's mainframe and vice versa. In the next 36 months, Murphy said, 1,000 people will use the DVI system to learn how to use the linking application.

However, the spotlight right now is on a prototype project that would put lessons about software and any other training

Departure time

Networking may be the force that makes digital video interactive (DVI) succeed

Networked DVI:

- Works on Intel Corp. 80386-based servers.
- No special cabling necessary.
- Microsoft Corp. Windows version expected this fall.

DVI applications:

- Training and retraining program at employees' desks.
- On-line help desk with images to reduce confusion.
- On-line marketing of products, real estate and services.



CS/STW Tech Monitor

equipment on their desks and to borrow compact disc/read-only memory (CD-ROM) discs to receive lessons.

Bethlehem Steel has designed a CD-ROM training program using DVI to educate employees as well as suppliers and

program onto Bethlehem Steel's growing PC network.

Bethlehem already is taking inventory of its estimated 20 local-area networks to see how DVI can be used on the existing Ethernet, Token Ring and other networks. "We're scavengers,"

Murphy said. "We'll try to retrofit DVI onto what we have."

He said that DVI's digital nature should help to ease bandwidth problems on most media.

"I don't think DVI will take off, really, until it is on networks," said Reinhard Ziegler, senior manager at Andersen Consulting's Change Management Services Division in Dallas.

One DVI software vendor, Protocomm Corp. in Treviso, Pa., has said it will ship a networking version of its Videocomm/NV product June 15. Videocomm/NV will support five workstations running on a Novell, Inc. Networkware Version 3 file server. It is priced at \$3,800.

Ziegler said that Intel Corp. 80386-based 25-MHz DOS servers can handle DVI without bogging down. Better performance will arrive with DVI for Unix boxes early next year, he said.

In a way, DVI may be almost as good for networking as networking is for DVI, Murphy said.

Ziegler said Andersen Consulting is integrating networked DVI systems for several clients and is designing such a setup for its own use. The internal system, he said, should be operational in six weeks, but he would not elaborate.

Westchester County opts for T3 links

BY JOANIE M. WEXLER
CW 22047

WHITE PLAINS, N.Y. — In its endeavor to interconnect several isolated local-area networks, Westchester County has decided to skip the T1 scene altogether and jump ahead to T3 (45M bit/

sec) technology.

While the county offices are currently using T1 gear from Timpalex, Inc. for low-speed RS-232 data connections and some voice connections, T1's 1.5M bit/sec. speeds are too sluggish to handle wide-area exchanges of the county's growing Ether-

net traffic, said Robert Gallagher, director of distributed systems.

Instead, Gallagher said, the county will initially invest \$200,000 in four Timpalex T33/Superhub systems, which will communicate over the wide area via private microwave radio

links. A private microwave network was chosen, Gallagher said, because the price of leasing terrestrial T3 lines from New York Telephone Co. is currently sky high.

For Gallagher's application, leased T3 lines from the local carrier would cost the county \$25,000 per month, he explained.

The only delay on the project,

which is slated to be up and running by fall, is the county's selection of a microwave radio equipment vendor. Gallagher said he expects to invest another \$200,000 in radio equipment, "so the total payback of having a private network will be about eight months," he said.

Timpalex's T3 gear will collect traffic from the county's 15 existing Timpalex Link/2+ multiplexers and concentrate it over the higher speed links.

Currently, Link/2+ multiplexers are used to haul traffic from about 2,000 stand-alone personal computers and dumb terminals to two mainframes in the data center here via T1 interface-equipped bridges.

3Com unveils bridge gear

BY JIM NASH
CW 22047

SANTA CLARA, Calif. — 3Com Corp. recently announced additions to both its adapter card and bridge product lines. The networking company said it is shipping a Micro Channel Architecture 32-bit bus master Ethernet adapter and a new version of its bridge router.

In an unrelated move, 3Com announced it will not sell off its Work Group Systems Division. The division, which is responsible for making network servers, workstations and related software, was one of the operations that in January 3Com said it would cast off.

Late last year, the firm decided to abandon its local-area network operations and move more directly into internetworking. 3Com sold its Mazes Systems Network Architecture Gateway Division shortly afterward.

A spokesman for the company said keeping the division will have no financial or structural ramifications for the organization. The spokesman also said buyers were willing to pay 3Com's undisclosed price but were unwilling to guarantee service or support standards that 3Com demanded.

Etherlink/MC 32 could give users noticeably better performance, said Rick Reed, network manager at Alon Corp. in Palo Alto, Calif. Because it is a bus mastering-based adapter, Etherlink/MC 32 takes some of the data transfer duties away from the central CPU, allowing the CPU to perform more quickly.

Reed added that the jump from 16 bit to 32 bit will boost performance. The adapter is selling for \$899 and includes Novell, Inc. Network Version 3.0 drivers and drivers for network driver interface specification-compliant DOS and OS/2 software.

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Eeeeeaaaaaah!



Users, vendors make Mumps contagious

BY ELISABETH HORWITT
CW Staff

COLLEGE PARK, Md. — A band of users and vendors wants to create a Mumps epidemic via an "open" networking interface it is said to give applications on multivendor systems access to Mumps databases.

Mumps, the Massachusetts General Hospital Utility Multi-Programming System, was developed 20 years ago as a high-level programming language with embedded database functions. While Mumps began as a medical system, it has caught on in the government as well as in a variety of commercial sectors, particularly overseas, according to Mumps Users' Group spokeswoman Peggy Halfman.

There are now approximately 75,000 Mumps users worldwide. Mumps' chief attractions are its ability to support high-volume database interactions and the terseness and flexibility of its language.

"I like Mumps' ability to allow one to concisely program," said Carl Bower, a computer specialist at the Department of Veterans Affairs (VA). "I also like its ability to support intensive interactive processing — you can do a lot of concurrent database accesses with Mumps."

The VA's health services and resources administration uses Mumps almost exclusively for health administration and clinical applications, Bower said.

Virtual Island

Open Mumps Interconnect, which was developed by the Mumps Users' Group, was designed to make the system's unique database features available to a broader group of systems and users. Right now, each vendor's Mumps implementation is virtually an island, accessible only by terminals and workstations designed to access that particular system.

In contrast, applications written to Open Mumps Interconnect would be able to access any Mumps server, according to John Althouse, chairman of the Mumps development subcommittee on networking and communications. What is more, client applications such as Lotus Development Corp.'s 1-2-3, once written to Open Mumps Interconnect, can access Mumps databases without requiring the client workstation they are running on to support full Mumps protocols, Althouse said.

The VA is so eager to get Open Mumps Interconnect that it has put a stipulation into some recent computer systems contracts that vendors must support the protocol as soon as it becomes available, Bower said. There is "a crying need" within

the VA for users to be able to access Mumps databases on a variety of remote systems, he added.

"I may be a dreamer, but I like the picture of one [distributed] system that makes clinical and administrative data available nationwide," he said.

Ten years ago, the only way to share data among different Mumps implementations was via magnetic tape, Bower said. More recently, various vendors have provided links between different Mumps systems, such as personal computers and Digital

Equipment Corp. VAXs, on a proprietary, one-to-one basis. "This first pass of OMI probably won't meet everyone's needs, but as a first step up from nothing, it's a big one," he said.

The user group designed Open Mumps Interconnect to be

easily portable to any underlying network protocol, so "there is no reason why you can't implement it on any virtual circuit,"

Althouse said. A demonstration scheduled for June will have a variety of multivendor Mumps implementations communicating via Open Mumps Interconnect on top of Transmission Control Protocol/Internet Protocol, running over Thawfire Ethernet.

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to link 1,200 personal computers, integrate an IBM mainframe and provide remote connectivity. In fact, its advanced capabilities earned Burnett the Excellence Award from the Enterprise Networking Institute.

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NEW PRODUCTS

Local-area networking software

Netmanage, Inc. has announced Chameleon, a Transmission Control Protocol/Internet Protocol applications package.

The Microsoft Corp. Windows 3.0-based software allows remote logons, transfers files and isolates problems on Token Ring and Ethernet networks. Chameleon communicates with host operating systems, including IBM's AIX, VM and MVS; Digital Equipment Corp.'s VMS and Ultrix; and The Santa Cruz Operation's Unix.

The product costs \$400.

Netmanage
10020 N. DeAnza Blvd. 101
Cupertino, Calif. 95014
(408) 257-6404

Network management

Bicc Data Networks, Inc. has announced Version 3.0 of the Ixview Network Manager, an open systems-based management system for OS/2 platforms.

Ixview's capabilities include multi-level topology display, performance monitoring with graphical display and fault management. The new version uses a modular design, allowing users to customize the product to their system require-

ments. The Kernel provides management access control, a graphical user interface and general management functions. Support modules can be added to manage specific bridges.

The Kernel is priced at \$5,000; Support Modules range from \$500 to \$1,000.
Bicc Data Networks
1800 West Park Drive
Westboro, Mass. 01581
(508) 898-2422

OS/2 networking

Sybase, Inc. has announced Sybase PC Net-Library, a set of networking modules integrating personal computer-based applications with Sybase's SQL Server.

The Net-Library runs under DOS, Me-

crosoft Corp.'s Windows and OS/2 and integrates both third-party and custom C language applications with all SQL Server-supported platforms. Each interface module costs \$145.

Sybase
6475 Christie Ave.
Emeryville, Calif. 94608
(415) 596-3500

Electronic mail

Novell, Inc. has announced Netware Message Handling Service (MHS) Version 1.5. The product was designed for large, complex networks.

It follows a standard Novell and Action Technologies, Inc. and is interoperable with the worldwide MHS installed base.

The product lists at \$495 but is available for \$100 during a promotional period that ends in August. Users of previous MHS systems from Novell or Action Technologies can upgrade for \$50.

Novell
122 East 1700 South
Provo, Utah 84606
(801) 429-7000

Modems

Ven-Tel, Inc. has begun shipping the pocket-size Fax Modem 24/96S.

The product features full duplex asynchronous communication at 2,400, 1,200 and 300 bit/sec. It supports Group III standard fax transmission at 9.6K bit/sec. The Fax Modem (\$189) operates for six hours on a standard 9-volt battery and weighs 6 ounces.

Ven-Tel
2121 Zanker Road
San Jose, Calif. 95131
(408) 436-7400

Front ends, multiplexers

Timeplex, Inc. has announced voice transmission and other enhancements to the Link+ T1/E1 multiplexer line.

New features include 8K bit/sec. voice compression and asymmetrical data link capability for the Link/2+ system (\$5,000 per voice module), increased capacity to 48 T1 lines for the Link/100+ hubbing system (starting at \$40,000) and distributed workstation capability for the Time/View 2000 network management system (\$4,000 per workstation).

All enhancements are scheduled to be available in the second quarter of 1991.

Timeplex
400 Chestnut Ridge Road
Woodcliff Lake, N.J. 07675
(201) 930-4631

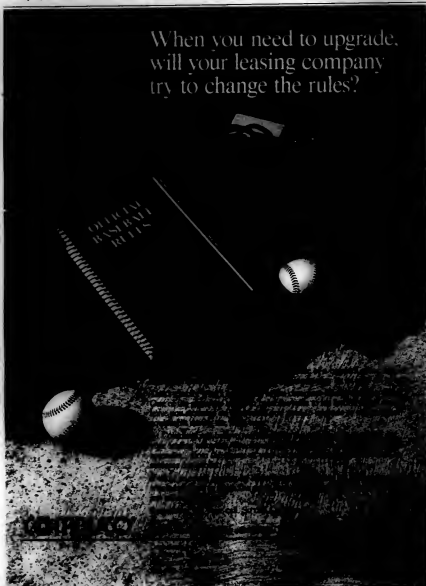
Micro-to-micro

Silverware, Inc. has announced an asynchronous communications software library for applications developed under Nantucket Corp.'s Clipper.

Silverclip SPSCS is interrupt-drive and offers features including a 115K bit/sec. rate, ANSI terminal emulation, character filtering and flow control.

Last price is \$349; the current introductory rate is \$299. Registered users of the company's Silvercomm library can purchase Silverclip SPSCS for \$99.

Silverware
Suite 740
3010 LBJ Freeway
Dallas, Texas 75234
(214) 247-0131



EXECUTIVE TRACK



Robert J. Stokes has been promoted to manager of technical support at the Port of Charleston, S.C., Information Services Division.

Stokes was most recently a senior systems programmer. As manager, he directs a staff of five technicians and systems programmers and reports to John Christensen, manager of the Information Services Division.

Stokes is responsible for all systems programming and operating systems software as well as for the communications network required to support Orion, the port's automated manifest filing system. Orion links more than 400 waterfront businesses to the port and to the U.S. Customs Service for rapid cargo clearance.

Stokes joined the South Carolina State Ports Authority in 1984 as a programmer/analyst.

Edward J. Curvey has been named director of the Internal Revenue Service Quality Assurance Division in Washington, D.C.

He is responsible for a support program to ensure the quality and effectiveness of the IRS information systems program.

An IRS employee since 1978, Curvey had been director of the Contracts and Acquisitions Division since 1987. Before that, he was assistant director of the Facilities Management Division for four years.

Curvey holds a bachelor's degree from East Stroudsburg State College and a master's degree from George Washington University in Washington, D.C.

Dick B. Schneider, former director of MIS at the IBM World Trade Corp., has been named director of technical projects at Bedford Associates, Inc., a consulting firm in Norwalk, Conn. Bedford Associates, a subsidiary of British Airways PLC, helps clients integrate and implement high-volume transaction processing and associated data communications systems.

IS adjusts as portables fly the coop

Unable to corral laptop PCs on the desktop, managers still keep them under control

BY MICHAEL FITZGERALD

CONTRIBUTOR

It's 10 a.m. Do you know where your company's laptop computers are?

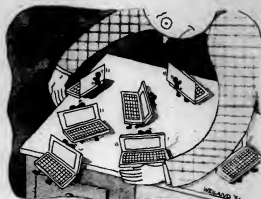
That question is an increasingly relevant one for information systems managers in the 1990s with the proliferation of laptop and notebook-size computers for a variety of business tasks. But fortunately, most corporate IS departments have their laptops under control — either by taking laptop management into their own hands or empowering end users to manage their own laptop technology. It is not a case of *deja vu* from the 1980s, when many IS groups turned their backs as personal computers invaded corporate America.

"I don't think we manage the laptops any different than we do the desktops," says Dick Nelson, vice president of agency systems at New York Life Insurance Co. "We've adopted a philosophy that anything that runs on the desktop must run on the laptop."

But another insurer, Blue Cross/Blue Shield of Massachusetts, handles things a bit differently. "I think you have to look at this as another platform; there are mainframes, desktops and then portables," says John Thibodeau, manager of end-user computing at Boston-based Blue Cross/Blue Shield.

Behind the general acceptance of portable computers is a more user-responsive IS management than was present in the 1980s. Many laptop implementations are driven by the users, and IS only offers support in many cases.

Nelson, for example, is a New York Life agency division executive, not an



Carroll Nelson

IS staff member. Hyundai Motor America and Coors Brewing Co. are two other companies whose IS departments do not handle laptop management.

Separating the user group from IS "has a very positive effect," Nelson says. "The fact that I'm an agency officer instead of an IS officer puts me closer to my customers, so there's a layer of bureaucracy that gets eliminated by that." He is quick to point out that "there are liabilities, too — if you're out of the mainstream, you may miss certain things, but we try and coordinate with what's happening in the IS department."

The main issues facing companies that purchase laptops stem from the mobility of the machines; tracking, field service and data security.

Companies have adopted different

methods of handling these issues. At Blue Cross/Blue Shield, Thibodeau says, portables are routed in two ways. There is an office pool of laptops for workers who happen to need one for the night; the rest are permanently in the hands of the sales force.

At New York Life, there is a similar division — employees are given laptops by the IS department, and a separate group has been created to handle models for its 10,000 agents. That group recommends the kind of portables its agents should buy, but the agents are responsible for their own machines, including having to insure them in case of theft or loss.

Theft of laptops has been no small concern at Coors in Golden, Colo., which has given laptops to its

Continued on page 58

Southwestern Bell goes with experience

BY CLINTON WILDER

CONTRIBUTOR

Southwestern Bell Corp. believes there is something to be said for longevity in this era of chief information officer turnover and company-hopping.

After the retirement of 40-year company veteran Kenneth R. Bender, 64, as vice president of information systems earlier this month, the St. Louis-based regional Bell holding company named 36-year veteran Glynne A. Davidson to replace him.

Davidson, 59, had been vice president of controller operations for Southwestern Bell's Texas region in Dallas for the past 12 years. He reports to Executive Vice President Rob-

ert Glaser, as did Bender.

Davidson is a strong advocate of user empowerment through personal computers, especially in a time of decreased IS spending.

Trimming down

Southwestern Bell's IS operating budget dropped 4% this year to \$192 million, marking the second straight year of lower spending. Early retirement incentives have trimmed the IS staff by about 2% since the beginning of the year to its present size of 2,700 employees.

"Doing more with less has been the bottom line here," Davidson said.

Davidson joined Southwestern Bell in Little Rock, Ark., after graduating from the University of

Central Arkansas in Conway, Ark., in 1954.

His career began in the punch-card era and included overseeing the installation of Southwestern Bell's first IBM 1401 system in 1961.

He has been with the firm in financial and IS-related positions ever since, except for a two-year stint at AT&T in the late 1970s. While there, he helped develop AT&T's Customer Records and Information System.

At Southwestern Bell's controller operations in Dallas, Davidson spearheaded the development of a PC-based billing and customer service system. Southwestern Bell has an approximate 1-to-3 ratio of PCs and terminals to employees corporatewide.

Ranked No. 29 in the 1990 *Computerworld* Premier 100, Southwestern Bell was a participant in the recently completed MIT Management in the 1990s research program.




Bell veteran Davidson has taken over CIO spot

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Portables

CONTINUED FROM PAGE 55

sales representatives, along with cars and portable telephones. Coors has had five of 200 laptops swiped, all but depleting its backup supply of six machines. Although making a self-insured co-insurance, Coors has to purchase outside insurance for its laptops because of the high risk.

"I wish somebody else had to manage them," sighs Donna Whitley, project manager at Coors Brewing. "It's a major headache."

Adding to the red tape for Whitley, an end user, is the necessity of dealing with four different people in the Coors accounting department to track depreciation. When employees leave the company, they must return their laptops with all the original documentation and software—a provision sometimes requiring management enforcement.

Another headache can be getting service for laptop computers in the field, but managers contacted report good luck with their portables, so far. Most say that they keep a small store of laptops on hand, to be given to employees when they send in a machine for repairs or if their laptop is stolen.

Data security on issue

The possibility of theft brings up the potential problem of stolen data. While most managers downplay this possibility, saying laptops get stolen for the hardware, not the software, several acknowledge that data security is an issue that hasn't been addressed.

"I suspect we are not as security-conscious as we should be, although most of the data on a single computer is not too sensitive," Whitley says.

Coors relies on changing user passwords when laptops get stolen and tells its sales force to do weekly backups. Relying on security at the mainframe level to keep peering eyes out is a staple at many companies.

Some managers report that they have to play policeman to prevent use of non-standard software or software piracy.

"That's a management headache," says Carrie M. Ulvestad, national manager of dealer communications at Hyundai Motor America in Fountain Valley, Calif. "You have to make sure they don't load games on the machine or other nonstandard software."

Barry Larson, director of systems and data processing at the Wisconsin Department of Transportation, agrees. "You have to be somewhat concerned about some of the software licensing issues," he says. "You have far less management control because they're not in the office."

Training new users, however, is rated less of a problem than one may expect. While this is in part because many portable users are already sophisticated PC users, many companies are giving laptops and notebook computers to noncomputer users. But managers report that training them as if they were new PC users is effective, and the transition to laptops is not as difficult as they expect.

In a Wisconsin highway construction project, "virtually none of those people were computer literate, and we felt that would be the major hurdle," Larson says. "Surprisingly, they really took to it."

Ultimately, the decision of whether laptops should be managed by IS or end

users depends on the organization. In many cases, it makes more sense for the users to be in charge, as long as things are kept under control.

If notebook computer and laptop use continues to expand, there could be a lot more happily surprised IS types, as long as they develop a strategy for their use in advance.

"A lot of companies are going through this," says Robert Peterson, director of sales and marketing IS at Coors. "IS organizations simply can't keep their arms around all the technology that's floating around in their organization. It's just a fact of life."

"The explosion of technology in our company in the last five years has been dramatic, and IS couldn't keep up with it."

Signet plans to outsource IS

RICHMOND, Va. — Signet Banking Corp. will soon become the latest convert to the outsourcing movement. The company expects to sign a contract by May 1 that will put its data center, operations for telecommunications, systems and programming support in the hands of Electronic Data Systems Corp.

"We expect the contract will reduce information service operating expenses by \$137 million over 10 years," said Floyd Griggs Jr., the firm's executive vice president of information systems.

Griggs said that outsourcing will also enable the financial holding company to move faster on a number of strategic in-

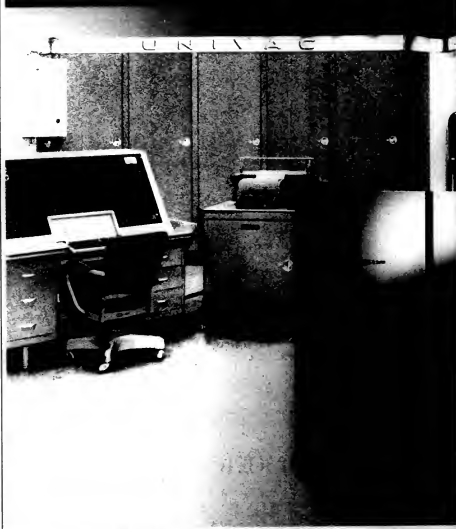
formation technology initiatives that it plans to implement during the next four years.

The initiatives were the main motivation for the IS department to recommend an outsourcing evaluation to management in the first place, Griggs said. The initiatives include migration from a multivendor mainframe operation to an all-IBM environment and implementation of automation procedures to move Signet toward lights-out data center operations.

"EDS has resources the bank lacks to some extent" for implementing these plans, Griggs said.

ELISABETH HOKWITT

From First. To Fastest.



CALENDAR

Client Server '91, a conference on the benefits of business process redesign along with client/server technology will be held May 28-31 at the Westin Hotel O'Hare in Chicago. Speakers at Client Server '91 include Nowell, Inc. Chief Executive Officer Ray Noorda, Meta Group, Inc. President Dale Kutnick and Nolan, Norton & Co. President Richard Nolan.

For more information or to register, contact Bonnie Sen, Washington University, St. Louis, Mo. (314) 889-5380.

MAY 12-18

Neosoft International Users Conference, Los Vegas, May 12-16 — Contact: Chris Peltanos, Neosoft Software International, Norwalk, Conn. (203) 845-5000.

The Hammer Sales, Marketing and Service Conference, Boston, May 12-15 — Contact: Hammer & Co., Cambridge, Mass. (617) 334-5555.

Office Systems and Networks Dialogue, Washington, D.C., May 12-15 — Contact: TTT, Santa Monica, Calif. (310) 394-8395.

Telecom Developers '91, Dallas, May 12-15 — Contact: Telecom Library, New York, N.Y. (212) 690-4245.

Micro Focus Users Conference, Orlando, Fla., May 12-16 — Contact: Micro Focus Users Conference, Palo Alto, Calif. (415) 855-9673.

Entry Modeling: Techniques and Application, Washington, D.C., May 12-17 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Legent Corporation's Users Conference, New Orleans, May 12-17 — Contact: Legent, Pittsburgh, Pa. (412) 322-2600.

Valeo Expo, Los Angeles, May 12-17 — Contact: Delco Rinda, Knowledge Industry Publications, West Plains, N.Y. (914) 328-9137.

State Administration Management Association Annual Symposium, Gaithersburg, Md., May 14-15 — Contact: Andrew Tyndal Norris, DMAA, Washington, D.C. (202) 453-1790.

Distribution/Computer Expo, Chicago, May 14-15 — Contact: C. S. Report, Essex, Pa. (215) 827-7436.

IBM Expo, Chicago, May 14-16 — Contact: Expense Management Association, Treadwell, Conn. (203) 376-1411.

Multimedia Expo, New York, May 14-16 — Contact: American Expositions, New York, N.Y. (212) 236-4141.

Software Research Quality Week, San Francisco, May 14-17 — Contact: Software Research, San Francisco, Calif. (415) 957-1441.

National Energy Software Conference, Arlington, Va., May 15-16 — Contact: MECS, Arlington, Va. (703) 972-7250.

Business Continuity Planning Conference, Atlantic City, May 15-17 — Contact: Sargent Planning Solutions, Wayne, Pa. (215) 241-8790.

Cambridge Open Systems Conference, Vancouver, B.C., May 15-17 — Contact: Corporate for Open Systems, Melton, Va. (703) 883-2700.

Brite Communications Conference, Tynesburg, Mass., May 15-17 — Contact: Andrea Resnais, Wang Institute of Boston University, Tynesburg, Mass. (508) 649-9731.

Exchange '91, Indianapolis, May 15-17 — Contact: Sterling Software, Dublin, Ohio (614) 793-7000.

Macworld Expo/Europe, Amsterdam, May 15-17 — Contact: Macworld Expo/Europe, Amsterdam, The Netherlands. (011-31) 20-549-7840.

Networks for the '90s, Boston, May 15-17 — Contact: Wang Institute of Boston University, Tynesburg, Mass. (508) 649-9731.

North American Open Systems Conference, Vancouver, B.C., May 15-17 — Contact: Corporate for Open Systems International, Melton, Va. (703) 756-2874.

International Partnerships in Computers and Communications Imperative for the '90s, San Francisco, May 15-18 — Contact: International Computers and Communications, Washington, D.C. (703) 467-3804.

Vantage Expo '91, Webster, Mass., May 18 — Contact: Betsy Smith, Imaging Technology, Webster, Mass. (713) 938-8444.

Valueconferencing: Type and Technology, Dallas, May 18 — Contact: Informa, Dallas, Texas (214) 748-3500.

MAY 19-25

Adjusting to Reality: New Profit Strategies of 1991 and Beyond, Palm Springs, Calif., May 19-22 — Contact: Information Industry Association, Washington, D.C. (202) 639-8282.

International Industrial Engineering Conference, Detroit, May 19-22 — Contact: IIE Register, Norcross, Ga. (404) 449-6490.

Share '91, Nashville, May 19-22 — Contact: Share, Chicago, Ill. (312) 822-0922.

Cisco Summer Institute, Boulder, Colo., May 19-23 — Contact: Cisco, Boulder, Colo. (303) 449-4430.

Ingress World 1991, San Jose, Calif., May 19-23 — Contact: Ingress, Alameda, Calif. (415) 760-1400.

International B2B Users Group Conference, San Francisco, May 19-23 — Contact: IUGC headquarters, Chicago, Ill. (312) 444-6616.

Association of Brite Communications Users Conference, Atlantic City, May 20-23 — Contact: Auger Brite, ADCU, New York, N.Y. (612) 861-8803.

Canada '91, Atlanta, May 20-23 — Contact: The Interface Group, Needham, Mass. (617) 449-8400.

Milwaukee Electronics Expo, Milwaukee, May 20-23 — Contact: Miller Presson Exposition, Boston, Mass. (617) 322-3076.

Windows World '91, Atlanta, May 20-23 — Contact: The Interface Group, Needham, Mass. (617) 449-8400.

Leadership in a Global Marketplace, Atlanta, May 21-23 — Contact: Shoren Scott, Informa Institute, Atlanta, Ga. (404) 220-5892.

Systems 21/200 Expo, Belmont, Ill., May 21-23 — Contact: National Publications, Salem, Mass. (508) 748-6818.

Uids and Open Systems, Santa Barbara, Calif., May 21-23 — Contact: Deborah Hay, Sayfield, Boston, Mass. (617) 745-5266.



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PRODUCT SPOTLIGHT

Look beyond the 'I-CASE' label

A closer look at 'integrated' tools reveals that assembly is often required, with no guarantee that the pieces will fit as you'd like

BY DAVID SHARON

Now that they've torn off the wrappings and had a chance to play with their new computer-aided software engineering (CASE) tools, many buyers have lost enthusiasm for their new software-engineer sets.

Purchasers of analysis and design CASE tools spurred that market's growth rate to 67% from 1984 to 1989, but tales of frustration helped to quell growth, which fell to 20% just one year later.

There are many reasons why users have become skeptical: a lack of portability among hardware and software platforms, non-standard graphical user interfaces (GUI) and closed, undifferentiable architectures.

Chief among their frustrations is a lack of integration between the vendor's own front-end and back-end tools and among tools from various vendors. Adding salt to the wound is the proliferation of the term "I-CASE," which refers to a variety of techniques vendors use to market tools as "integrated."

Simply put, integration is the ability to bring together tools from all parts of the life cycle to operate as one. Information systems groups discovered that nonintegrated, "point" products lead to inefficiency and a lack of automated control.

The output of an analysis and design tool, for instance, loses some of its semantic meaning when it is loosely connected to another vendor's code generator.

In addition, many users would like to integrate their current development and maintenance tools with CASE software methodologies, structured methods

and object-oriented tools.

Vendors use the term I-CASE to mean three things: tool suites sold by a single vendor, integrated project support environments (IPSE) that are integration frameworks and tool-to-tool interfaces between products from multiple vendors.

We might do well to imagine that the "I" in I-CASE stands for "ideal" and not "integration." In that case, very few vendors would qualify. This ideal CASE environment could be compared to a software factory (see diagram page 62), where the factory itself is the environment

and the CASE tools are the machines. The machines are interconnected by conveyor belts, which provide the integration. All raw material, work in process and finished goods are stored in the warehouse or the CASE repository.

In this ideal environment, five operating requirements are met: Tools can be integrated and interconnected, there is an open architecture and common user interface, and the system is portable to any hardware or software environment (see story page 66).

Striving for ideal CASE

The products that come closest to the ideal I-CASE environment are the systems sold by single vendors (see chart listing page 76). Andersen Consulting, Texas Instruments, Inc., Knowledgeware, Inc. and CGI Systems, Inc. all offer product suites in which the tools are tightly coupled and are governed by a rigorous methodology and produce complete systems.

These environments provide a central repository for storing project data as well as the tool-coordination mechanisms and methods for controlling and monitoring all project tasks.

Even among these tools, however, satisfaction with the level of integration varies (see Buyers' Scorecard page 72).

A much more substantial problem is that these systems essentially lock the user into using a single architecture. If a user wanted to use most of the tools provided by the single vendor with another vendor's reverse engineering tool, he'd have to resort to using the import/export facilities — a somewhat primitive method — provided by the single vendor.

Unlocked architecture

Realizing that most organizations are unwilling to lock into a single architecture — whether they want to buy their development tools or more than one

Continued on page 62



Steve Lamm

INSIDE

What's New?

Reuse, cross-development are two recent trends. Page 68.

Buyers' Scorecard

Users rate TI's IEF the top single-vendor CASE tool. Page 72.

Product Guide

Analysis/design/code generation tools from single vendors. Page 76.

Sharon is president of CASE Associates, Inc. in Oregon City, Ore., a consulting firm specializing in CASE market and product research. He also publishes CASE product directories and buyers' guides.

Full deck

Most vendors offer only a subset of a full life cycle environment. A complete life cycle software development environment includes the following:

DEVELOPMENT

- **Front-end CASE:** Planning, requirements, analysis, design, simulation and prototyping.
- **Back-end CASE:** Code generation, editing, compiling, testing, debugging and integration.

TEAM ENGINEERING

- **Project database:** Communications, monitoring, security and control.
- **Management:** Methodology, configuration, project and acquisition.
- **Support:** Maintenance, re-engineering, verification, database administration and control and documentation.

Continued from page 61

source, or they have internally developed tools they wish to integrate into a CASE environment — some vendors are beginning to offer frameworks or IPSEs. Two examples of IPSEs are Hewlett-Packard Co.'s Softbench and Atherton Technology, Inc.'s Software Backplane.

IPSEs do not perform actual software development functions but provide an environment that can integrate tools from other vendors. Within this environment is a common user interface, a central project repository and tools for configuration, process, project and requirements management to support system engineering. IPSEs offer operating systems portability and tool coordination facilities.

These frameworks are fashioned around the reference model from the upcoming Portable Common Tool Environment standard (PCTE). PCTE, which is one of three primary guidelines for building integrated environments, includes the essential ingredients for integration as well as the framework for an IPSE.

IPSEs use repository-based integration to link tools together and transfer information among them under a common user interface. (The single-vendor products mentioned above also use repository-based integration.) Like an automated

warehouse, the repository stores the output of every life cycle phase and the relationships between the outputs.

IBM's AD/Cycle and Digital Equipment Corp.'s Cohesion are also IPSEs, but they have front-end and back-end tools already integrated. As with Softbench and Software Backplane, multivendor tools can be integrated into AD/Cycle and Cohesion.

Some IPSEs do pose problems for users, however. Current implementations, offered by hardware manufacturers — with the exception of HP's, which runs on Sun Microsystems, Inc. systems — are portable to proprietary platforms. They can also exhibit poor semantic information transfer among tools, and there can be extensive effort involved to add a new tool to the environment.

Blue-collar answer

The most primitive method for integrating CASE tools is to use tool-to-tool interfaces from vendor alliances. These interfaces are usually provided through import/export facilities or file-transfer mechanisms. Some vendors refer to this as multivendor I-CASE.

Tool-to-tool interfaces may be the most primitive, but they are also the oldest, simplest and most commonly used mechanism for CASE tool interconnection, especially between analysis/design tools and code generators or among analysis/design tools from different vendors.

The primary function of these interfaces is to read and write information from one tool's data dictionary to another's, eliminating the need to re-enter data and thereby reducing data entry errors. Either the interfaces are provided by the vendor, or the customer must write his own using a vendor-supplied I/O utility.

Many strategic alliances have evolved from this approach, including those among Deloitte & Touche, Index Technology Corp. and Pausatic Systems, Inc.; Interactive Development Environ-

Checklist

Before you buy an "integrated" tool, ask the vendor if it meets the following criteria:

- ✓ Do the tools operate together as if they were one multifunction tool?
- ✓ Can I do all the work I need to do?
- ✓ Can I use my own tools or my favorite tools from another vendor without losing functionality?
- ✓ Is the data shared between tools, eliminating the need to re-enter data and allowing the outputs of each tool to be verified for consistency and completeness?
- ✓ Is all the data kept in a common database or repository?
- ✓ Is use of the tools governed by a definable process or methodology?
- ✓ Do the tools use a common user interface?
- ✓ Are the results meaningful, usable and complete? That is, are all requirements from the analysis phase used in the design phase, and is 100% of the code generated from the design specification?

DAVID SHARON

Short term can be worth it

BY SUSAN R. NYKAMP
COURTNEY R. TYKAMP

Integration isn't always a top priority in CASE tool purchases. Sometimes it makes sense to start small with an easy-to-use tool that addresses only one part of the development life cycle.

Just ask Howard Kushner at MCI Telecommunications Corp. and Dale Hardy at The Hanover Insurance Co. Each made a \$7,000 investment in front-end CASE tools they may very well abandon after their firms settle on integrated, full life cycle tools.

Kushner, project manager at MCI, is using EasyCase Plus from Evergreen CASE Tools, Inc. in Redwood, Wash.

"If we only get a year of use out of EasyCase, it will easily pay for itself," Kushner says. "It doesn't offer everything the big guys do, but it's pretty much everything we need right now."

An MCI corporate committee is in the midst of evaluating full life cycle tools as a standard platform. In the meantime, Kushner wanted multiple

users to do process modeling but didn't want to make a big training investment. Priced at about \$300 for each copy, EasyCase fit the bill.

"It's not the top-of-the-line CASE tool... but that's all right," he says, adding that his group will wait to do things such as enterprise modeling when the corporate standard for a full life cycle CASE tool is established.

Hardy, a systems consultant at Hanover Insurance, had similar requirements. He is using Visible Analyst Workbench from Visible Systems Corp. Hanover is also evaluating full-function tools, but Hardy needed a tool that would allow multiple users on a local-area network to do data modeling.

Hardy rejected Erwin from Logic Works, Inc. and Pose from Computer Systems Advisors, Inc. as cumbersome to use and says EasyCase "lan't in the same league" as Visible Analyst.

Hardy says he is impressed with Visible Analyst's user interface and process modeling capabilities but feels the reporting capabilities limited.

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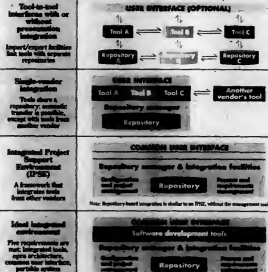
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Integration techniques

Current products integrate tools in the following ways, although the ideal does not yet exist



Continued from page 62

semantics of the information transfer.

There is no common environment because each tool has its own repository that users must maintain separately. The burden of integration is on the tool user, who must reconcile the multiple user interfaces, tool repositories and each tool's processing requirements and outputs.

Some vendors transfer information directly from one tool to the other, bypassing the data dictionary. This is the optimal tool-to-tool interconnection technique.

One example of this is Panosha's Exchange, which is used to modify the designs created by Intel's Accelerator, which in turn drives the Telen code generator. Sage and Interactive Development also use this approach.

Presentation Integration

Tools can appear to be more integrated than they actually are when coordinated by a common user interface, called "presentation integration." With a GUI such as the Open Software Foundation's Motif or X Window System, two disparate tools can have a common look and feel.

This approach ignores semantic transfer and repository issues. What is lacking is data storage and retrieval, tool coordination and process management.

The primary barriers to the ideal CASE environment are not technical but

rather psychological and financial. Vendors that think they can "do it all" are reticent to integrate with others, while best-in-class vendors tend to leave the problem of integration to someone else.

Vendors with tools supporting limited life cycle phases must choose among strategic partners or become yet another participant in someone else's framework. Single I-CASE vendors must either decide who to integrate into their proprietary environment or rearchitect their products to create an environment open to all vendor tools.

The ideal software factory should emerge by 1995. In the meantime, smart shoppers will ask all the right questions to find a vendor whose integration vision matches their requirements. ■

Software factory components

The ideal integrated CASE environment is no different than a manufacturing operation for software—a software factory of sorts. The operating requirements are similar to those for building and running the ideal manufacturing operation:

- The ability to integrate tools using a common user interface (control panel) for invoking the tools and a repository for storing the data created by the tools. Project data should be stored and managed in one central information warehouse.
- A mechanism for interconnecting tools to transfer the semantics of data created by one tool and used by another (the assembly line). The tools must use the same

interpretation of the data transferred.

- A methodology, or mechanism, for defining the software engineering process rules and requirements that govern the use of the tools making up the environment (process control). Without a methodology, the factory is out of control.

- An extensible, open architecture that allows users to change each tool's behavior and rules to conform to their cultures and requirements (machine retooling).

- An environment that is portable over a wide range of operating systems and platforms to preserve the investment and extend the life of the environment.

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Vendors' claims; users' realities

Typical claims by vendors include the following:

PROMISE: Full life cycle support.
REALITY: No vendor offers a full life cycle product as most users understand the term. Most offer only a subset of the life cycle, so be sure to ask which specific phases are supported.

PROMISE: Complete support for one life cycle phase or another.
REALITY: Some products provide only limited support; for example, 100% code generation is not always possible.

PROMISE: Integrated tools.
REALITY: Users expect all tools in the environment to work together in a consistent, uniform manner. The truth, however, is that not all tools are integrated the same way.

PROMISE: Open architecture.
REALITY: Users expect to incorporate their own and other vendors' tools into the environment. However, the vendor may provide only an import/export facility for data sharing, not full integration.

PROMISE: Integrated environment.
REALITY: Users expect a common user interface and the ability to incorporate multi-vendor tools with a common look and feel. A common user interface does not guarantee that the tools are well-integrated or that they provide complete support.

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'Have I got a repository for you!'

BY STEVEN BARSH
and WILLIAM GILTINAN

You read all the articles on ADT/Cycle and Cobson. You hear about dictionaries, encyclopedias and repository-enabled tools. You're trying to get the repository that makes the most

sense for you, but all you're getting is confused.

So, how do you choose a repository? Basically, a repository has three components:

- A database for storing information about software projects.
- An interface through which computer-aided software engi-

neering (CASE) tools can access the database.

• A definition of what information the tools can store in the repository.

The goal of a repository is to provide one central location for many tools to store and exchange information about soft-

ware development projects.

Virtually every CASE tool vendor has its own proprietary repository. Other vendors are creating universal repositories for all CASE tools, including IBM with Repository Manager, Digital Equipment Corp. with CDD/Repository, Computer Associates International, Inc. with CA '90s Repository and Oracle Corp. with CASE Dictionary.

When choosing among these products, first consider the database — its performance, how well it runs in a distributed environment and how well it interacts with your current hardware and software.

Next, consider the tool interface. If the repository vendor provides an unwieldy interface, few tool vendors will be willing to integrate their products.

For its new CDD/Repository, DEC chose to take an object-oriented approach to create a simple, flexible tool interface.

IBM, on the other hand, formed alliances with some of the major CASE vendors and says these tools will interface with its repository.

Third, consider the richness of the data definition (metamodel) that defines what informa-



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Repository vendors

- Amadeo Corp. (Sunnyvale, Calif.)
- Computer Associates International, Inc. (Garden City, N.Y.)
- Computer Corp. of America (Cambridge, Mass.)
- Digital Equipment Corp. (Maynard, Mass.)
- DEDIS Corp. (Waukegan, Ill.)
- IBM (Armonk, N.Y.)
- Innaparc Corp. (Edison, N.J.)
- Oracle Corp. (Redwood Shores, Calif.)
- Unisys Corp. (Detroit)

Source: M.E.A. Inc. CW Chart Database/M.John

tion tools can be stored in the repository. If the metamodel does not encompass all of the information used by a particular CASE tool, the CASE tool vendor either cannot store that information in the repository or must unwieldily extend the repository to include that information.

For instance, if you use a tool with a new diagramming technique, another vendor's development tool may be unable to read the information captured in those diagrams. Why? Because the diagramming tool had to extend the metamodel to it could store information captured in the new type of diagram. Tool B knows nothing about Tool A's modeling technique because it is not defined in the base metamodel.

IBM's strategy is to create a metamodel so comprehensive it will not need to be extended. Its metamodel is so far incomplete, DEC and Oracle both have complete metamodels, but they're expecting CASE tool vendors to extend the base metamodels and provide tools to help the vendors perform the extension.

Barsh is president and Giltinan is a senior consultant at SECA, Inc., a Cranbrook, Pa.-based firm that provides software engineering and CASE tool implementation and consulting services.

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New trends abound in CASE

BY GENE FORTE

In the face of fierce competition and industry consolidation, computer-aided software engineering (CASE) vendors are scurrying to add more functionality to their product lines. There are many trends for users to keep an eye on, including the following:

► **Cross-development tools.** Logically network-based cross-development tools allow developers to define, generate and test applications on a workstation or personal computer, waiting until deployment to specify the target platform.

Because applications need to be spec-

ified just once for multiple platforms, management can not only defer equipment decisions but also move applications or upgrade to new platforms with fewer restrictions. Cross-development also provides a CASE environment naturally suited to client/server applications.

CGI Systems, Inc.'s Pacian for OS/2 LANs and Pacian/X for Unix LANs exemplify this trend. An application designed on one workstation or a group connected by a LAN to a Pacian repository server can be targeted at IBM OS/2, MVS and OS/400 platforms or Unix, Tandem Computers, Inc. and Digital Equipment Corp. VMS platforms. Andersen Consulting's

Foundation for Cooperative Processing and the upcoming version of Texas Instruments, Inc.'s IEF are two other cross-development products. However, both still require an encyclopedia, or repository, based on a target platform.

Intersolv, Inc. — the newly merged Sage Software and Index Technology Corp. — has moved its APS workbench to the PC network, as has Software AG of North America, Inc. with its recently announced Entree architecture.

► **Hypertext guidance for CASE development methods.** Faithfully following a rigorous development method can be difficult for new CASE users. Some vendors now offer methodology guidance tools that use hypertext to support meth-

od-browsing at various levels of detail.

These tools use built-in application examples to help developers through rough spots. For example, The Delphi Group's Software Engineering Environment provides a guidance facility for a variety of preconfigured common methods, although it also accommodates proprietary processes.

James Martin Associates' IE Expert gives a comprehensive explanation of the information engineering method with stages, tasks, deliverables and typical examples. The developer can explore information engineering in any sequence to the depth desired and can hot-key to tools such as TI's IEF and Knowledgeware, Inc.'s Information Engineering Workbench.

► **Practical approaches to reuse.** CASE vendors are starting to provide facilities that allow developers to reuse code. For large-scale reuse, Andersen Consulting's Designware products come with turnkey applications implemented using the company's Foundation environment. Developers can create a customized version of a generic application by modifying data definitions and screens and regenerating the application without touching source code.

TI is pursuing a similar strategy with its IEF templates. These include a complete general ledger package and an upcoming investment management system for insurance and mutual funds companies derived from Credit Data Corp.'s DIMS.

Computrol, Inc. is taking a different approach to making its Master Financial System reusable. Instead of a top-down code-generation environment, Computrol has made the product modular and has added parameters for each functional subsystem. Developers can select and customize the desired functionality simply by altering tables and screens.

Traditional reuse focuses on small modules of functionality — called objects — with well-defined interfaces that can be assembled into larger applications. Because graphical user interfaces (GUI) are an ideal application for the object paradigm, GUI tools such as Apple Computer, Inc.'s Macapp and the X Window System library are among the leading facilitators of small-scale reuse.

However, newer products extend the simple GUI building blocks to more powerful objects that are essentially mini-applications. Examples of these tools include Asymetrix Corp.'s Toolbook for Windows 3.0, Expertelligence, Inc.'s Spokenation and Integrated Systems Division's SystemBuild.

► **Case for the chief executive officer.** The newest niche of CASE tools allows business processes to be directly modeled and automatically converted to functioning computer systems.

Vendors catering to this niche claim that CEOs as well as application developers will find the tools useful. One example is Metavision from Applied Automatics, Inc. Key to the company's approach is its Cybernetic Business Model, which generates systems directly from a visual model of business operations.

Delays from S/Cubed, Inc. allows businesspeople and developers to use familiar objects to describe the requirements of a computer system. ■

Forte is president of Portland, Ore.-based CASE Consulting Group and executive editor of "CASE Outlook," an international journal on software design automation.

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PRESS RELEASE

SAGE AND INDEX FINALIZE MERGER, FORMING INTERSOLV

Rockville, Md., March 19, 1991 - Sage Software, Inc. and Index Technology Corporation today announced completion of their previously announced merger, forming a new entity to be called INTERSOLV, Inc.

Kevin J. Burns, former chief executive officer of Sage, will serve as chairman and CEO of INTERSOLV.

Burns said the merger creates the industry's largest supplier of computer aided software engineering (CASE) tools, with combined installed customer base of over 10,000 sites worldwide.

"The formation of INTERSOLV, by combining the strengths of Sage and Index CASE products that span the entire software development lifecycle, creates a company is to products deliver comprehensive solutions to customers that they can rely on as their main software development tool."

Index Technology Corporation, a leading provider of software development tools, has been a part of the Sage family since 1987. The company's products, applications and services are integrated through Design Engineering, Development, Testing and Deployment.

INTER SOLV, Inc. is a privately held company with headquarters in Rockville, Maryland. The company's products are sold through direct sales, value-added resellers and through the Sage Software distribution network.

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E Company That's s Since March 19, 1991.

The merger of Sage Software and Index Technology does far more than just bring together two strong CASE companies. It merges two companies with complementary strengths to focus on a common vision: a vision of where the market must go to fulfill the promise of CASE.

At INTERSOLV, our combined 17 years of CASE experience has taught us that you can't build applications in a hyperintegrated and closed environment. We have a unique solution: the benefits of ICASE, but with a modular implementation approach that reduces upfront costs and risks.

Our solution takes into account the realities of the 1990s development environment: the development cycles, methods, and tools that developers really work

with. The solution may have been developed by CASE and ICASE, but it's not a CASE or ICASE solution. It's an INTERSOLV solution.

entire development lifecycle. They include Excelerator for design, APS for application generation, PVCS for configuration management, and Design Recovery for maintenance/re-engineering.

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BUYERS' SCORECARD

Due to a lack of photographic contrast, this page did not reproduce well.

TI's IEF scores high for integration, benefits delivery



Integrated computer-aided software engineering (I-CASE) tools

Total scores reflect average user ratings for all measures, weighted by user-assigned importance. Response base: IEF: 33; Pacbase: 40; Foundation: 30; IEW/ADW: 40.

Product	Highest ratings	Lowest ratings
Texas Instruments' IEF 	Integration of life cycle stages Ability to increase quality Code generation capabilities	Ability to work with other vendor's tools Support for local-area networks Training time required
CGI Systems' Pacbase 	Data repository capabilities Code generation capabilities Ability to increase quality	Ability to work with other vendor's tools Training time required Planning, analysis and design features
Arthur Andersen's Foundation 	Integration of life cycle stages Ability to increase quality Support for local-area networks	Ability to work with other vendor's tools Code generation capabilities Training time required
Knowledgeware's IEW/ADW 	Ability to increase quality Planning, analysis and design features Integration of life cycle stages	Support for local-area networks Effectiveness of testing Ability to work with other vendor's tools

BY MICHAEL L. SULLIVAN
TRAINOR
CW EDITOR

Like street corner jugglers, vendors of integrated computer-aided software engineering (I-CASE) tools are being asked to balance an increasingly complex set of items to satisfy the wishes of their audience. Not only do they need to excel in planning, analysis and design features, but they must also offer strong repository and code-generation functions.

Small wonder that the market for single-vendor I-CASE tools can be narrowed down to four players with significant market share: Texas Instruments, Inc.'s IEF, CGI Systems, Inc.'s Pacbase, Arthur Andersen & Co.'s Foundation, and Knowledgeware, Inc.'s IEW/ADW.

When *Computerworld* polled users of these four products, IEF received the highest ratings overall from its users for I-CASE features, followed closely by Pacbase. Foundation and IEW/ADW finished in close competition further back.

Each group of users rated only its own product. A 1-to-10 (poor to optimal) rating system was used for each feature and function. (See methodology next page for explanation of how total scores are derived.)

Overall, users ranked integration and repository features as more important than individual front-end or back-end categories.

IEF placed first in 12 of 19 Buyers' Scorecard categories, in addition to garnering the highest individual rating — 9 out of 10 — for product set integration.

IEF topped three out of four benefit-oriented categories, including increasing applications quality (8.9), programmer productivity (8) and value for the

dollar (7.6). Pacbase users rated their product highest in the remaining benefit category: ability to increase speed of applications development.

IEF scores were particularly low in two areas: ability to work with other vendors' tools (3.9), a category in which none of the products received higher than a 4.8, and support for local-area networking (4.4). Pacbase achieved the highest ratings for data repository capabilities (8.7), which ranked as the second most important consideration for users overall. Second to IEF in most categories, Pacbase garnered top marks in quality of technical support (7.6) and compatibility with the current environment (7.2).

Four last-place finishes reduced Pacbase's overall score. These lower rankings were: working with other vendors' CASE tools (3.8), training time required (4.9), ease of use (5.8) and planning, analysis and design features (6).

Foundation received the top mark for LAN support (7.1). Its highest user ratings came in the categories of integration (7.4) and increasing applications quality (7.3). Overall, Foundation placed last in 10 of 19 categories.

IEW/ADW, the front-end tools market leader, achieved a 7.5 rating for planning analysis and design features, a second-place finish behind IEF's 7.9. Another 7.5 rating placed the product second for integration behind IEF.

IEW/ADW also placed first in its ability to work with CASE tools from other vendors, with a 4.8 rating from its users. However, four last-place ratings, including ability to increase development speed (5.2), programmer productivity (6.1), efficient programming capabilities (5.5) and support for LANs (3.1) — the lowest individual rating — caused IEW/ADW to rank behind Foundation in the overall score. *

KEY RATINGS

Quality, productivity, integration and value are among the most important categories for I-CASE buyers, and TI's IEF users give their product the highest rating in those areas. Speed and data repository capabilities are also vital, and CGI Systems' Pacbase achieves the top scores on those counts.

User Importance Rating

8.9 Ability to increase application quality



8.4 Data repository capabilities



8.4 Ability to increase the speed of applications development



8.3 Ability to increase programmer productivity



8.2 Integration of life cycle stages within product set



8.1 Value of the dollar



A CLOSER LOOK

IEF also receives the strongest marks in eight of 11 remaining categories: Arthur Andersen's Foundation achieves highest ratings in LAN support and compatibility with the current environment. Knowledgeware's IEW/ADW, the upper CASE market leader, receives the highest rating in ability to work with other vendor's CASE tools.

User importance rating

7.9 Responsiveness of vendor service



7.5 Efficient programming capabilities



7.2 Training time required to use product



8.1 Planning, analysis and design features



7.8 Overall ease of use



7.4 Effectiveness of testing



6.6 Support for local-area networking



8.1 Quality of technical support



7.8 Code generation capabilities



7.3 Compatibility with current computing environment



5.2 Ability to work with CASE tools from other vendors



Verbatim

What do you like best/about this product? (Responses are based on most frequently stated answers)



Likes
Life cycle integration/Methodology
Effective code generation

Dislikes
Not easy to use with other workstations/LANs
Reporting capability



Likes
Data repository
Life cycle integration/Methodology

Dislikes
Steep learning curve
Not user friendly



Likes
Life cycle integration/Methodology
Methodology fits well into our system

Dislikes
Not easy to use with other workstations/LANs
It's slow



Foundation

Likes
Life cycle integration/Methodology
Methodology fits well into our system

Dislikes
Not easy to use with other workstations/LANs
Too complex, cumbersome



Loyalties

How likely would you be to purchase this product again if you were making the decision today? (Responses based on most frequently stated responses)



Response base: 33
Likely
The reason: Effective integration
Unlikely
The reason: Not good on a network
Number of respondents: 32



Response base: 40
Likely
The reason: Capable product, reliable
Unlikely
The reason: Not good on a network
Number of respondents: 35



Foundation



Response base: 30
Likely
The reason: Serves purpose well
Unlikely
The reason: Not good on a network
Number of respondents: 22



Foundation



Foundation



Foundation



Foundation



Foundation



Foundation



Foundation



Vital statistics

Total number of respondents: 143

How long have applications developed with these tools been in production?

Five to six years	7%
Three to four years	23%
One to two years	30%
Less than one	54%
Don't know	1%

What is your position?

Director	16%
Manager	56%
Staff member	18%
Other	10%

For how many years have you used I-CASE tools?

Five or more	23%
Three to four	39%
One to two	36%
Less than one	2%

METHODOLOGY

To qualify for Computerworld's Buyers' Scorecard on integrated computer-aided software engineering (CASE) tools, a product had to be integrated across the life cycle. In addition, the vendor had to be a market share leader in planning, analysis and design tools and/or code generation tools.

Among the products surveyed, the market share included: planning, analysis and design — Knowledgeware, Inc., 36%; Temis Instruments, Inc., 9%; Arthur Andersen & Co., 4%; code generation — CGI Systems, Inc., 17%; Knowledgeware, 8%. Figures are based on Computer Intelligence's survey of IBM-compatible mainframe or minicomputing sites.

The response base for qualifying products was as follows: TTY IEF: 32; Knowledgeware's IEW/ADW: 40; CGI Systems' Pacheco: 40; Arthur Andersen's Foundation: 30.

The survey was conducted and tabulated by First Market Research Corp. in Austin, Texas, an independent telephone research firm. Randomly chosen users were surveyed. Total weighted scores were computed by multiplying the same importance scores assigned to each criterion by the same scores each user group gave its own product.

CASE use

Thirty-six percent of the 143 respondents reported that the major benefit received from use of their particular I-CASE tools was increased quality of applications; 27% said maintenance and enhancements capability; and 24% said consistency of design.

Forty-four percent of respondents said they chose the methodology before the tools; 38% chose the tools first, and 14% chose both at the same time. Fifty-five percent and less than half of their applications development staffs were trained to use the tools.

ACKNOWLEDGMENTS

Computerworld thanks the following individuals and companies for their assistance: Computer Intelligence, Le Jella, Calif.; Vaughn Meryns and Gary Baskin, CASE Research Corp., Boston; and Digital Consulting, Inc., Andover, Mass.

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Analysis/design/code-generation tools¹

VENDOR	PRODUCT	SHIP DATE OF ORIGINAL/ MOST RECENT VERSION	OPERATING SYSTEMS SUPPORTED	HARDWARE REQUIRED	DATA REQUIRED (BYTES)	FUNCTIONS PERFORMED ^a	SOURCE CODE LANGUAGES ORIENTED	CAS METHODOLOGIES SUPPORTED	DBMS SUPPORTED	BUILT-IN NETWORK CONTROL	USER INTERFACE	NETWORKS SUPPORTED	PRICE
Amprotek Management Systems, Inc. (612) 845-5500	Life Cycle Productivity System	June 1988/Elec.	IBM PC, IBM PS/2, IBM XT, IBM AT	IBM PC or compatible, Expanded/286, VGA	64KB for DOS, 640 KB for OS/2	Real prototyping, testing	C, C++	DeMars, LPT Methodology System	Adabas, DB2, dBase	Yes	Command line, Prototyping, Presentation	Novnet	\$12,000 for PC, \$15,000 for DOS, \$275,000 for dBase
Anderson Consulting (312) 360-5361 (800) 458-6861	Provisioner	March 1988/Elec. Jan. 1991 for PC	IBM CICS, OS/2 1.1 and 1.2, DOS/PC, VAX/VMS, OS/2, VMS	IBM PC or compatible, System/370 and 3084, 3090, 3091, 3092, 3093, 3094, 3095, 3096, 3097, 3098, 3099, 3100, 3101, 3102, 3103, 3104, 3105, 3106, 3107, 3108, 3109, 3110, 3111, 3112, 3113, 3114, 3115, 3116, 3117, 3118, 3119, 3120, 3121, 3122, 3123, 3124, 3125, 3126, 3127, 3128, 3129, 3130, 3131, 3132, 3133, 3134, 3135, 3136, 3137, 3138, 3139, 3140, 3141, 3142, 3143, 3144, 3145, 3146, 3147, 3148, 3149, 3150, 3151, 3152, 3153, 3154, 3155, 3156, 3157, 3158, 3159, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3167, 3168, 3169, 3170, 3171, 3172, 3173, 3174, 3175, 3176, 3177, 3178, 3179, 3180, 3181, 3182, 3183, 3184, 3185, 3186, 3187, 3188, 3189, 3190, 3191, 3192, 3193, 3194, 3195, 3196, 3197, 3198, 3199, 3200, 3201, 3202, 3203, 3204, 3205, 3206, 3207, 3208, 3209, 3210, 3211, 3212, 3213, 3214, 3215, 3216, 3217, 3218, 3219, 3220, 3221, 3222, 3223, 3224, 3225, 3226, 3227, 3228, 3229, 3230, 3231, 3232, 3233, 3234, 3235, 3236, 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Applied Automation, Inc. (312) 845-5516	Interconnect	1/8/88/Elec.	DOS, OS/2	IBM PC or compatible, 2M	64KB	Enterprise and resource management, report processing	C, C++	Giles & Sargent, BRP/VSAM, dBase, dBase III, dBase IV, dBase V, dBase VI, dBase VII, dBase VIII, dBase IX, dBase X, dBase XI, dBase XII, dBase XIII, dBase XIV, dBase XV, dBase XVI, dBase XVII, dBase XVIII, dBase XIX, dBase XX, dBase XXI, dBase XXII, dBase XXIII, dBase XXIV, dBase XXV, dBase XXVI, dBase XXVII, dBase XXVIII, dBase XXIX, dBase XXX, dBase XXXI, dBase XXXII, dBase XXXIII, dBase XXXIV, dBase XXXV, dBase XXXVI, dBase XXXVII, dBase XXXVIII, dBase XXXIX, dBase XL, dBase XLI, dBase XLII, dBase XLIII, dBase XLIV, dBase XLV, dBase XLVI, dBase XLVII, dBase XLVIII, dBase XLIX, dBase L, dBase LI, dBase LII, dBase LIII, dBase LIV, dBase LV, dBase LVI, dBase LVII, dBase LVIII, dBase LIX, dBase LX, dBase LXI, dBase LXII, dBase LXIII, dBase LXIV, dBase LXV, dBase LXVI, dBase LXVII, dBase LXVIII, dBase LXIX, dBase LXX, dBase LXXI, dBase LXXII, dBase LXXIII, dBase LXXIV, dBase LXXV, dBase 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ALL CASE environments listed perform analysis, design and source-code generation for building business applications. Each vendor lists all the required components for its environment; so third-party products are required, and integration techniques vary. All products perform analysis, design and code generation. Additional functions are listed in the chart. ¹Forrester Inc. Technology Corp. and Sage Software. ²Parasoft's TriForm/Teamwork is a version of Cadence Technologies' Teamwork, with Parasoft's TriForm and Dynamic's Teamwork added. TriForm/Teamwork is available only through Parasoft.

The companies included in this chart responded to a recent survey conducted by [Comptonsworld](#). When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

[illegible]

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Object lesson

Understanding the principles behind object-oriented technology is the first step toward reaping its benefits of code reuse and ease of maintenance

BY DANIEL TASKER

Optimists see object orientation as the next silver bullet. Pessimists see it as the next arrow in the chest of pioneers. Somewhere between these two extremes lies reality.

Information systems professionals have a lot to gain from finding that middle ground: improved requirements and analysis methods, code reusability and ease of applications maintenance. These features can offer considerable relief from development backlogs and maintenance burdens.

However, achieving such object-oriented benefits is not easy; this approach to designing and building applications requires changing mind-sets. Nor do benefits accrue overnight. While off-the-shelf tools that support generic objects such as windows and lists do exist, there is still a need for in-house analysis and development for the specific objects a business needs. Object-oriented work will require close to traditional development time frames at first.

Object principles

To understand the positives and negatives of object-oriented analysis, design and programming, it is necessary to understand that it operates under different principles than the software development environments that have come before. It also has its own terms (see glossary page 84).

Traditional development has focused primarily on function or what the system does. In a function-based view, program logic is composed of instructions that emulate what people do. In this function-oriented world, data is usually structured in any way necessary to make the system execute its task in the shortest time possible.

It's true that IS shops get their tailored code to execute faster, but the legacy of developing systems from a purely functional

perspective is a tangle of production applications and databases. This mess has become difficult, if not impossible, to manage. It is time to shift focus.

Objects represent a new way of looking at programs. Rather than seeing a system purely on the basis of what it does, object orientation looks at the elements (objects) involved. Each object within the system is analyzed to establish what it knows (data) as well as what it should do (function). Objects interact with other objects only by sending messages, similar to subroutine calls. These

simple the reuse of code. Typically, when reuse is mentioned in relation to object orientation, it refers to the practice of arranging objects into class (or type) hierarchies, through which they inherit knowledge and action properties. Therefore, for example, logic for "hiring" different subtypes of "employees" (such as "secretary," "engineer" and "salesman") does not have to be either called or copied. Logic is established once for the "employee" object and is inherited (reused) by the other subtypes.

Inherited data

Inheritance works for data components of objects in the same way as for action or functional components. "Secretary," "engineer" and "salesman" inherit "name" and "hire date" from the "employee" object. The object-oriented system automatically makes them available to all of the subtype objects.

Reusing business objects across applications is where IS can realize the greatest productivity improvements: reuse obviates the need to build code from scratch every time.

Reuse through inheritance is different from more traditional forms of subroutine libraries in which members of such libraries typically perform special functions, such as date conversion or statistical calculations. There are two difficulties with this traditional setup. First, code intended to be called as a stand-alone routine requires special effort to properly structure it. Second, organizing significant numbers of members (more than 50) in subroutine libraries is not easy. Functions are difficult to classify on their own.

It is typically faster to recode simple functions than to spend time searching for one that exists within a list of tens or sometimes hundreds of callable routines.

Action properties within objects, on the other hand, are always designed to be

Continued on page 80



Kurtzman/Mohrney

messages request information from or action by other objects.

Two types of objects in a banking system, for example, might be "customer" and "account." Each "customer" object knows its name, address and so on. "Customer" objects perform actions such as "make deposit" and "make withdrawal." "Account" objects know their "balance" and "interest rate" and perform tasks such as "calculate interest" and "produce a bank statement." A "customer" object wanting to know an account balance sends the message "tell balance" to the appropriate "account" object, which acts on the message.

This object-oriented approach makes pos-

- A shift from function view to data view
- Firms implement what they can
- A glossary of object-oriented terms

Tasker is a Sydney, Australia-based independent consultant and author of the book *Fourth Generation Data*.

Continued from page 79

callable. Access to an object's knowledge or actions can be obtained via messages, with inheritance hierarchies providing a natural classification structure. Thus, besides providing automatic reuse through inheritance, these structures aid in locating functions for reuse via messages.

Reuse instances

Reusing only the definitions of objects (their knowledge and action properties) is not sufficient. Advantages of object orientation can be lost if object instances are not reused as well.

For example, a university might develop a course enrollment application that includes the "person" hierarchy and populate it with subtype instances of

"students" and "faculty," along with their relationships to other objects such as "course." A second project team at the school developing a payroll application can copy the "person" hierarchy. The team can take advantage of reusing the definition of "person" and "faculty," adding a new "staff" subtype.

However, if the payroll application is run on a different computer, it will not be able to directly reuse the object instances found in the course enrollment application. It will require either redundant entry of faculty information and duplicate updates over time or additional extract and update transaction mechanisms between it and the enrollment systems.

This is the same kind of situation that results in redundant data in application-

specific databases and end-user query tables that support traditional function-based applications. IS can reduce initial development time by reusing (copying) existing object definitions, but in the long run, these new applications will experience the same kinds of problems found in today's production systems.

Not a recognized problem

Instance reuse has not yet been widely recognized as a problematic issue in the object-oriented community, perhaps because groups experimenting with object orientation have done so only on a pilot application basis in which no programs overlap. Clearing up these traditional types of problems, however, is important in taking full advantage of object orienta-

tion's maintenance strengths.

Program complexity and interdependency are two of the major issues affecting program maintenance. Complexity relates to the additional time needed to locate the appropriate code for a required change. Spaghetti code, clever logic and heavily modified programs all contribute to slowing this search. Structured techniques are intended to address the complexity problem, but the majority of production applications have not been developed using these techniques.

Program and/or systems interdependency (the passing of transactions or even whole databases between systems) means maintenance staff members must spend additional time identifying the potential ripple effects of a program change. With many of today's larger (and older) applications, it has become impractical, if not impossible, to do thorough impact analysis. Standard practice in many shops is to take care of the most obvious cases and then let the program run. A team is usually kept close by to fix whatever fails.

This is not a pretty situation but a reality nonetheless.

What object orientation has to offer in this area is encapsulation based on data-

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Implementing bits and pieces

Object-oriented technology is not just a lot of hype. Even without industrial-strength languages and database management systems, companies are applying object-oriented principles to analysis, design and even implementation.

Westpac Banking Corp. in Sydney, Australia, captures user requirements in the form of business objects for its redevelopment of core banking applications. Implementation of these objects is being accomplished using IMS and Cobol. The firm has committed more than \$100 million (Australian) to this multiyear development project.

By performing extensive object-oriented analysis on its banking products, the organization expects to be able to mix and match product features implemented as reusable objects. Reusing objects will enable Westpac Banking's IS department to develop applications in days and weeks instead of weeks and months.

New Zealand Insurance, also based in Sydney, is using traditional languages and database technology to implement support tools for delivering applications based on object-oriented principles. Early tests indicate these tools will be able to offer tailored insurance applications in a greatly reduced time frame.

However, companies currently having success in the object-oriented field have had to invest significant time, money and effort. Companies implementing applications using object-oriented languages and DBMSs have had to accept the risks that come with an emerging technology, few standards or off-the-shelf products and vendors with short track records.

centered objects. Encapsulation is basically a fancy term for surrounding all knowledge properties with action properties. Objects are isolated from one another. An object needing to find out what some other object knows or to change that knowledge is not permitted to access (read or update) the data directly. It must send a message asking for the information.

Objects, therefore, have "telling" actions as well as "update" actions for each of their knowledge properties. Although this may sound a bit tedious, it allows for maintenance changes to objects without impacting other objects.

In the case of updates to knowledge properties, other objects may send information relevant to the update, but only the object containing the knowledge has the logic to implement the update. This guarantees that maintenance will be required only in a single, well-classified location.

Instance reuse, in which one application copies object definitions for its own use, creates a situation that can violate encapsulation, however. Even if a single database were shared by

are in their earliest stages.

IS organizations' understanding of object-oriented concepts is not much more advanced.

Even so, some organizations are taking advantage of what object orientation can offer today (see story previous page). Some companies are applying it to stand-alone applications. Others that understand the benefits of enterprise-wide data sharing are

using it to share/reuse functions through object-oriented style hierarchies and encapsulation.

IS shops can benefit today from object-oriented principles without risking existing production technologies. The first step is to increase the understanding of the concepts.

The study of object orientation should be approached not only from the function perspective

but also from the data perspective. Because they take a data-centered perspective on systems in which they identify entities (persons, places and things), data analysts and data modelers make an easier transition to the idea of "objects." Their experience can help companies organize the enterprise's data along object-oriented rather than function-specific lines.

Requirements for new systems expressed from the perspective of objects can be useful, even when implementing applications in traditional nonobject-oriented languages and database technologies.

Beginning to structure such applications using object-oriented principles can only help in delivering reuse and maintenance benefits to companies. ■

OBJECT-ORIENTED technology is about where relational database management systems were eight to 10 years ago.

both applications, there is now more than one source of logic that delivers or updates the same fact. Maintenance to only one of these copies would mean the fact could be operated on by different logic.

To prevent this, the exact same changes must be applied to all copies of object definitions. Locating and changing two or more copies obviously increases maintenance time and effort. It will require some form of documentation procedure to keep track of exactly which systems have taken copies of which object definitions.

What can be done today? Although object orientation has been around for many years, it is only recently that it has received major attention from vendors and methodologists. The technology (programming languages and object-oriented database management systems) is about where relational DBMSs were eight to 10 years ago. Some promising products are available, but none are considered "industrial strength" or "strategic" enough for major business applications. Furthermore, object-oriented language standards

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Term paper: An object-oriented glossary

Object/Instance: An individual item of interest in the system. For example, in a banking system, each customer (Jones, Smith and so on) is an object, or instance of an object type (or class), of customer. Each account, statement, etc., is an object or an instance of its type.

Object class/class/object type: A generalization of the objects (or instances) of interest in a system. The generalization is based on all of the instances having common properties. "Customer" is the object class for the objects Jones and Smith, each of which has a name and ad-

dress and performs similar actions.

Object property/feature/attribute/method: A component of an object (type) that either represents something that the object knows (such as a knowledge or data property) or something that the object does (such as an action the object is capable of carrying out). Thus, for the object class "customer," "name" and "address" are the knowledge properties, and "make deposit" and "make withdrawal" are the action properties.

Message: A request issued by an object for another object to respond to. This response can take the form of supplying a piece of information, such as returning a customer's name to the message sender, or initiating some action, such as accepting a withdrawal amount included in a "withdraw" message and updating a balance.



All interaction among objects is via messages. The name of the message must match the name of the receiving object's action property or an action the object inherits from some-

where higher in its class hierarchy.

Class hierarchy/type hierarchy: A relationship structure in which an object is identified as a special case of another. For example, a "customer" is a special case of "person," and a "savings account" is a special case of "bank account." Objects inherit properties (knowledge and actions) from all general objects above them in the hierarchy. The immediate "parent" of an object in a hierarchy is called the superclass of the object. The immediate "child" of an object is called a subtype.

Many object-oriented systems allow for an object to have more than one parent, enabling it to "inherit" upward through more than one structure.

Inheritance: A feature of object orientation that automatically makes available to a given object any properties of objects above it in a type hierarchy. Thus, a "student" object is considered to have "name" and "address" properties, which are actually defined as part of its superclass, "person."

Encapsulation: A limitation imposed on objects whereby knowledge properties are directly accessible only by action properties of the same object. Any other object wishing access can only do so indirectly by sending a message. This message is serviced by the appropriate action property, which provides the required information. For example, an account balance can be provided to message senders through a "tell balance" account action.

Polyorphism: Means "taking many forms." Different action properties of different object types are allowed to have exactly the same name. Thus, two or more subtypes of an "account" object (for example, term deposit, Christmas club and so on) can each have an action property "calculate interest," with the logic within each being appropriate to that type of account.

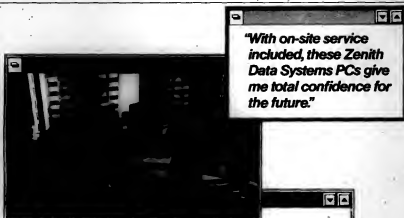
Polyorphism provides for different objects to respond differently to the same message, depending on the object type that receives it.

Dynamic binding: A special program execution feature that waits until the last minute to determine exactly which action property in which object to send a message to (also referred to as branching). With static binding, the branch destination is fixed when the program is compiled.

Because of polyorphism in object orientation, a message with a given name may actually want to access different actions (program logic), depending on the particular object type being processed at the time. In this case, dynamic binding is required so the appropriate action is invoked when each type is determined.

Persistence: A state in which an object's knowledge is required to remain intact when the object-oriented system is not active. Traditional records in databases are persistent; instances of window objects are not. When the system is shut down, the window ceases to exist. A new instance is established when the application is activated again.

So, although a window for accepting customer account details is not persistent, the details as part of the customer instance are.



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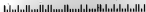
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NATIONAL BRIEFS

JDC gets some R&R

► Reynolds and Reynolds Co., the Dayton, Ohio-based purveyor of computer systems to automobile dealers, inked an agreement last week to buy the assets of neighboring NCR Corp.'s JDC Data subsidiary. Based in Vejle, Denmark, JDC Data supplies computer systems to the Scandinavian market, and, more recently, the German — automobile markets as well as to gas stations, lumberyards and accounting firms. It also supplied \$52.3 million in revenue to NCR in 1990. Terms of the deal were not disclosed.

Ball N?

► French computer firm Groupe Bull last week bought out former partner Honeywell, Inc.'s remaining 12.8% interest in Bull HN Information Systems, Inc. The long-planned move completes Honeywell's exit from the computer industry and gives Groupe Bull an 85% stake in the Billerica, Mass.-based Bull HN. Japan's NEC Corp. — the N in Bull HN — remains a 15% owner of the firm. Honeywell said last week it would remain on board as a key Bull customer.

Sterling deal

► The slimming of Control Data Corp. continued last week as the Minneapolis-based computer vendor poised to sell its Rednet Services division to Dallas-based Sterling Software, Inc. Rednet, an electronic data interchange (EDI) network services and software supplier, will join the EDI Group, which Sterling said is the fastest growing part of its business. Both firms said they expect the deal to close by the end of June.

Ready, steady, go public

► Smart-bus manufacturer Chipcom Corp. recently made prophets out of those analysts who have numbered the company among those most likely to launch an initial public offering this year. The Southboro, Mass.-based firm went public on March 22 at \$10 to \$12 per share. Proceeds from the sale of the initially offered 1,550,000 shares of common stock will be used for general corporate purposes including product development, Chipcom said.

Banyan: Make-or-break time

Enterprise networking pioneer's technological leadership on the line

ANALYSIS

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — To say that Banyan Systems, Inc. should be watching its marketing p's and q's these days would be putting it mildly.

Banyan, historically noted for its technology leap in enterprise-wide networking but chided for its lack of marketing acumen, might soon hit a brick wall if it does not quickly come through with some fancy marketing and development footwork, analysts and users said recently.

Some questioned whether the 550-person, privately held company is moving fast enough to allow it to thrive much longer without being purchased by a major industry player.

"The biggest question mark is how long Banyan can survive with just a sliver of market share," said Janet L. Hyland, director of network strategy services at Cambridge, Mass.-based Forrester Research, Inc. A recent Forrester study of Fortune 1,000 firms revealed "a strong jitteriness" about Banyan's vi-

bility as a company because of its size, despite widespread enthusiasm for its Virtual Networking System (VNS) network operating system. Hyland said.

Banyan has long had a head start in enterprise networking with its AT&T Unix System V-

It's now or never if Banyan is to make it big

In the high-growth LAN operating system market, Banyan Systems, Inc. must move fast to avoid being trampled

Worldwide value of PC LAN operating system shipments, 1990-1994 (in billions)



Source: Dataquest Data Corp.



based VNS. The network boasts a global naming service, known as StreetTalk, that lets geographically dispersed VNS local-area networks plug into one another. This enables users

to communicate directly with remote computers over wide areas without having to know and specify their precise locations.

To date, StreetTalk remains unchanged in the industry, but competitors are said to be scrambling to roll out similar naming

services within 18 months. They are also enhancing networking software and forming partnerships to challenge VNS in the enterprise market (see story page 86).

Banyan's mission, analysts said, should be to listen to the market and act fast on what it hears. For example, customers at the recent Association of Banyan Users meeting in Montreal said large-account-oriented Banyan must start selling into smaller accounts to build "mind share" (CW, April 15).

Users are also demanding Vines interconnectivity with other vendors' LANs and support of many more computing platforms as "clients" — computers that request data and services from VNS' Unix-based servers.

"Banyan has barely gotten off its own proprietary hardware," said Frank Micholish, program director of desktop computing strategies at The Meta Group, Inc. in Westport, Conn.

Making progress

With the release of Vines Version 4.10 at the Montreal conference, the network is making progress. Vines 4.10 added OS/2 client support along with further integration of Minidit Corp. Windows environments to existing MS-DOS clients. Support for Apple Computer, Inc. Macintosh clients is next on VNS' list, according to the firm.

In contrast, Novell's Netware LAN has long supported DOS, Windows, OS/2, Unix and Macintosh clients — which makes

Continued on page 86

Q1: Upbeat results indicate promise instead of disaster

BY NELL MARGOLIS
CW STAFF

IBM's first-quarter fall from earnings grace [CW, April 15] earlier this month wrenched havoc on Wall Street and set industry observers dourly speculating as to how bedraggled other recession-wrecked companies' quarterly reports might appear. However, a slew of upbeat first-quarter results pointed by computer companies last week indicated that despite a grim preview of coming contractions, the year's opening quarter may turn out to be a good show.

"We've seen upside surprises already, and I've got a sneaking suspicion we're in for more," said Joseph Payne, an analyst at Alex. Brown & Sons, Inc. For instance, he noted, "People forget that in a recession, peripherals do better than computers."

Louisville, Colo.-based storage and retrieval systems purveyor Storage Technology Corp. saw revenue increase 9% to \$282 million for the quarter,

while net income swelled 73% to \$15 million.

San Jose, Calif.-based Conner Peripherals, Inc.'s net income for the quarter ended March 31 soared 127% to \$35 million on revenue up 63% to \$382 million.

In addition, several analysts pointed out, the same recession-induced fears that make companies clutch their wallets also sharpen their appreciation of assets that endure or that protect other assets. Healthy first-quarter figures are expected from Stratus Computer, Inc., Payne said, owing to the fact that "their fault tolerance is real, and their customers know it."

During hard times, emphasis also shifts to service, analysts said. At Roseland, N.J.-based Automatic Data Processing, Inc., for example, employer services — which contribute some 60% of the firm's bottom line — enjoyed double-digit year-to-year growth in the first quarter, fueling the firm to a 14% increase in earnings per share and its 119th consecutive quarter of

First-quarter earnings 1991

Recession equals arduous times for computer makers while peripherals manufacturers tally profits

Company	Revenue Jan. through March 1991	Percent change from 1990	Profit Jan. through March 1991	Percent change from 1990
Apple Computer, Inc.	\$1,880	15%	\$233M	(3%)
AST Research, Inc.	\$180M	31%	\$17M	74%
Automatic Data Processing, Inc.	\$480M	4%	\$70M	74%
Bardel International, Inc.	\$70.6M	103%	\$8.4M	102%
Cray Computer Corp.	\$89M	—	\$12.5M	—
Cyress Semiconductor Corp.	\$69.1M	31%	\$8.1M	9%
Diethelm, Inc.	\$13.9M	140%	\$1.2M	(94%)
Intergraph Corp.	\$267M	23%	\$19.9M	32%
NCR Corp.	\$1.4B	8%	\$46M	(2%)
Pyram Technology Corp.	\$56M	44%	\$5M	33%
Seagate Systems, Inc.	\$16.2M	21%	\$2M	56%
Tandon Corp.	\$113M	7%	\$6M	12%
Transtek Instruments, Inc.	\$52M	7%	\$5.4M	—
United Telecommunications, Inc.	\$1.2B	7%	\$4M	(22%)

Percentages indicate a reduction or loss

CW Staff; Deven S. Juhn

10% or better earnings-per-share growth.

Meanwhile, many of the quarter's happier tales serve as a reminder that rolling out new and needed products — on time and

at the right price — is a winning gambit in good and bad times alike, said David Wu, an analyst at S.G. Warburg & Co. "Another is sound management with a talent for cost control," he added.

Banyan

CONTINUED FROM PAGE 85

Network appealing to a broader group.

"Users are looking to hook all their heterogeneous clients together at the server and get on with their applications development," Michnoff explained.

Bill Sheehan, director of information services at the Commonwealth of Massachusetts Metropolitan District Commission, verified Michnoff's assessment. "The main thing I want to do is integrate my Macintoshes into my Vines network," he said. "I'd also like connectivity to other platforms."

Last July, Banyan hired Compaq Computer Corp. veteran James D'Alessio as marketing vice president. Since that time, the firm has increased its marketing budget by 50%, inducted a six-member marketing team and retreated from the network server business to focus attention on its major strength: LAN software with inherent wide-area communications capabilities.

In addition, the company is expanding its distribution channel. For example, the ink is barely dry on an agreement to extend Messenger Telex Corp.'s resale, service and support of Vines from the southern U.S. to the entire nation.

On the interoperability front, Banyan's February announcement of a partnership

with AT&T coincided with the availability of products that allow Vines networks to communicate with AT&T's LANs. The fact that the announcement reflected actual product availability recouped some credibility for Banyan, analysts said.

The industry is still stinging from the firm's May 1990 promise to deliver interoperability between Vines and Microsoft's LAN Manager. That project — labeled "nothing but pure smoke" by Infonetics Research Institute, Inc. President

Michael Howard — is reportedly still under way, though its only fruits have been some OS/2 applications programming interfaces added to Vines 4.1.0.

D'Alessio conceded that "it's time we did a better job of delivering on our promises. We need to put up or shut up."

Despite its historic marketing Achilles' heel, the firm increased worldwide sales from \$46 million in 1988 to \$98 million in 1990. According to International Data Corp., Banyan reported that fourth-quarter

1990 revenue of \$26 million was up 35% from the same quarter in '89.

Hyland asserted that the quarterly growth "looks good, but not great. Banyan is slowing down in terms of resource dollars" it can invest to keep its technological upper hand. She said the firm has refrained from going public because of continuous senior management turnover and a revenue growth slowdown resulting from its retreat from the hardware business.

SIEMENS NIXDORF



Shifting winds

Novell strides toward adding wide-area networking capabilities to its traditionally work group-oriented Netware LAN could help the firm encroach on Banyan's global networking turf.

For example, Novell added T1 support to its server last year. Based on client feedback, Kevin O'Neill, network research and consulting vice president at Newton, Mass.-based Business Research Group, said the move kept Novell from losing many customers to enterprise-oriented Banyan.

In February, Novell "blew the industry away" when it introduced Netware v3.11, according to Forrester Research's Janet L. Hyland. The revamped network operating system includes support for several key communications parameters in addition to its proprietary IPX/SPX. It also brings Apple Macintosh network clients into the existing MS-DOS, Windows, OS/2 and Unix Netware client fold.

At the time of the v3.11 announcement, Novell also partnered with IBM in a worldwide reseller agreement that, by combined installation numbers alone, allows the two firms to rub elbows with a large chunk of would-be Vines users.

All these moves enhance Netware's attractiveness to firms with multivendor computing environments — the profile of firms moving toward enterprise-wide networks.

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Software lawsuit prompts questions on patents

ANALYSIS

BY JAMES DALY
CPI STAFF

Is the software patent the doornail of the computer industry? Paul Heckel thinks so. For the second time in as many years, the industry veteran and Hypercard, Inc.

president is gearing up to defend a software patent he says has been repeatedly walked on since he obtained it in 1984. In the process, he could write an important new chapter in the battle for intellectual property rights.

Heckel claims to have invented the on-screen image of a stack of file cards and used it in a product called Zoomcards.

Several years later, Apple Computer, Inc. employed a similar motif in its much-heralded Hypercard. Heckel sued and won, forcing Apple to cut him a substantial check and draw up a technological cross-licensing swap.

Now Heckel is challenging both IBM and Asymetrix Corp. Asymetrix produces an application builder called Toolbook

that IBM bundles with some Personal System/2 models.

"So far, nobody has gotten hit real hard over misuse of software patents," said Heckel, a former consultant to Xerox Corp.'s legendary Palo Alto, Calif., Research Center. "Maybe when they do, patents will start getting treated with the respect they deserve."

[Although Heckel has yet to formally file charges, and IBM and Asymetrix spokesmen related his claims, the stand-off has reignited long-simmering debates about the need for software patents. Depending upon which side is speaking, software patents are either an essential protective armor for innovative programmers or a suffocating pillow over the face of the software industry.]

Patent vs. copyright

Unlike copyright laws, software patents protect an application's fundamental technology. A programmer who uses an entirely different code yet produces a functionally similar application could be in deep legal trouble.

A patent grants exclusive rights for making, using and selling the invention for 17 years. Once a patent exists, anyone who wants to further develop the software must obtain a license from the patent holder.

Critics such as the League For Programming Freedom based in Cambridge, Mass., said software patents are not only irksome but dangerous. They bundle the risk of a lawsuit into every design decision in the development of a program, League President Jack Larnes said.

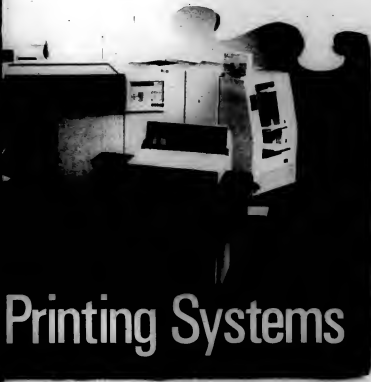
League members said it is difficult and expensive to figure out whether each specific programming technique is patented. To avoid a lawsuit, developers would need to make each new product look completely different. Heckel questioned such arguments. "So little software has been patented and the scope of most patents [is so] relatively narrow that the chance of a programmer trampling over someone's patent is very slim," he said.

Recent years have seen a shift to stronger patent laws, said Richard Bernacchi, an attorney with the law firm of Irell & Manella. A major reason is the 1982 creation of the Court of Appeals for the Federal Circuit, which has upheld 70% of the patents that have been challenged before it, he explained. "The district and appellate courts were not able to understand technology, so there was a tendency to invalidate patents because they feared a monopoly," Bernacchi said.

Many observers placed the problem at the door of the Patent Office. "The Patent Office is not adequately armed with qualified technical examiners and a large enough database to determine who already owns a patent and who should be granted one," said Ken Wasch, president of the Software Publishers Association in Washington, D.C.

A typical patent search will also frequently overlook pending patent applications. Since it typically takes several years for a software patent to be granted, this presents a serious problem. A developer could design and release a large program after a patent has been applied for but only learn later that distribution of the program is prohibited.

Instead, Wasch argued, copyrights should be the vehicle for protecting intellectual property. While patents protect ideas, copyrights protect the expression of those ideas.



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Cheap surge protectors not always best answer

BY ALAN RADDING
SPECIAL TO EW

IF YOU SPEND \$8 to \$20 for a metal oxide varistor (MOV) surge protector and you think your personal computers and networks are protected, think again. Some information systems workers and users are now saying that these low-end offerings are just not good enough.

Surge protectors are designed to intercept sudden jumps of power in computers and to dissipate them harmlessly. Problems with power surges show up as inexplicably lost or damaged data, sudden crashes and seriously damaged hardware. PCs and workstations are particularly vulnerable to power surge damage because they draw relatively little power.

There are two major problems with common, inexpensive surge protectors. First, they are built using MOVs, which capture the sudden surge of power but wear out quickly and soon become use-

less. "We used to use MOV protectors, but they'd only last until the first lightning storm," says Chris Jackson, manager of Summit Jackson Manufacturing Co. in Lubbock, Texas.

Second, the low-cost devices divert the surge to the ground wire, which can interrupt data flow and corrupt data in a network environment. Even with a stand-alone PC, diverting the surge to the ground can cause



garble in documents from an attached modem or printer.

In a 1988 technical paper, Francois D. Martoff at the National Bureau of Standards first identified the dangers inherent in MOV-

based surge protectors, particularly when surges are diverted to the ground. "An unexpected side effect of these surges... was apparent damage suffered by the data line input components," he noted.

Power engineers also recognize the limitations of MOV-based surge protectors. "The problem with MOVs is that they fail open, and you don't know

they failed," says Kenneth Brill, president of Computerite Engineering in Danvers, Mass. When the MOV fails, it lets the surge pass through unchecked and unknown to the user until it causes damage.

Now there are alternatives to MOV-based devices. Zero Surge, Inc. in Princeton, N.J., and Sutton Design, Inc. in Ithaca, N.Y., offer devices that cost from \$150 to \$190. The alternatives don't rely on MOVs exclusively; instead, they provide additional filters and circuitry associated with MOV-based products. Isolation transformers can also do the job, but they are large, heavy and very expensive.

However, just because these products are available doesn't mean much. IS workers and users say they are having a tough time appealing to their managers to spend three to five times more on the new offerings than they would on a MOV-based surge protector.

"It's hard to convince somebody to spend \$150 when they can spend as little as \$8 for something they think does the same thing," says Bill Shuff, a materials engineer at General Electric Co. in Schenectady, N.Y.

Few organizations have a formal protection policy for end-user PCs and workstations. "We don't require one except where it is mission-critical. It depends on the user's preference,"

says Stephen Rood, manager of microcomputer technology at New York-based Coopers & Lybrand.

In the hope of sparking more IS response, individual users and IS workers have started a grassroots campaign around the issue of surge protection, carried on

the Geoserve Division of Manufacturers Hanover Corp. He finally installed the Zero Surge device and the problems stopped. Now it is the only protector his department uses.

"Nobody complained about the cost. We spend \$3,000 to \$5,000 for a workstation, so an-

IT'S HARD TO CONVINCE somebody to spend \$150 when they can spend... \$8 for something they think does the same thing."

BILL SHUFF
GENERAL ELECTRIC

through user groups and electronic bulletin boards. The campaign has yet to make much headway in large corporations.

For instance, Shuff learned about the Zero Surge device through an Apple Computer, Inc. user group. He tried the product on computer equipment that had suffered from mysterious damage, and the problem was fixed. However, his company won't formally adopt Zero Surge on all of its systems.

Corporate users usually turn to the more costly surge protectors only as a last resort. "We were having a series of Netbios errors on one local-area network. It's difficult to prove, but we suspected the problem was surges," says Marty Stanton, IS officer at

other \$150 for a surge protector seems reasonable," Stanton says.

Weber Marking Systems, Inc. in Arlington Heights, Ill., incorporated the Sutton Design surge protector into its label printing systems because the device represented a compromise between the low-cost devices and more costly systems.

Compared with five low-cost MOV devices Weber Marking Systems reviewed, the Sutton product "did the job without getting into really large money," says Gerald Permann, Weber's senior IS buyer. "Many of the cheap ones did nothing," he adds.

Ranking is a free-lance writer in Newton, Mass.

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3249, 3250, 3251, 3252, 3253, 3254, 3255, 3256, 3257, 3258, 3259, 3260, 3261, 3262, 3263, 3264, 3265, 3266, 3267, 3268, 3269, 3270, 3271, 3272, 3273, 3274, 3275, 3276, 3277, 3278, 3279, 3280, 3281, 3282, 3283, 3284, 3285, 3286, 3287, 3288, 3289, 3290, 3291, 3292, 3293, 3294, 3295, 3296, 3297, 3298, 3299, 3300, 3301, 3302, 3303, 3304, 3305, 3306, 3307, 3308, 3309, 3310, 3311, 3312, 3313, 3314, 3315, 3316, 3317, 3318, 3319, 3320, 3321, 3322, 3323, 3324, 3325, 3326, 3327, 3328, 3329, 3330, 3331, 3332, 3333, 3334, 3335, 3336, 3337, 3338, 3339, 3340, 3341, 3342, 3343, 3344, 3345, 3346, 3347, 3348, 3349, 3350, 3351, 3352, 3353, 3354, 3355, 3356, 3357, 3358, 3359, 3360, 3361, 3362, 3363, 3364, 3365, 3366, 3367, 3368, 3369, 3370, 3371, 3372, 3373, 3374, 3375, 3376, 3377, 3378, 3379, 3380, 3381, 3382, 3383, 3384, 3385, 3386, 3387, 3388, 3389, 3390, 3391, 3392, 3393, 3394, 3395, 3396, 3397, 3398, 3399, 3400, 3401, 3402, 3403, 3404, 3405, 3406, 3407, 3408, 3409, 3410, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3418, 3419, 3420, 3421, 3422, 3423, 3424, 3425, 3426, 3427, 3428, 3429, 3430, 3431, 3432, 3433, 3434, 3435, 3436, 3437, 3438, 3439, 3440, 3441, 3442, 3443, 3444, 3445, 3446, 3447, 3448, 3449, 3450, 3451, 3452, 3453, 3454, 3455, 3456, 3457, 3458, 3459, 3460, 3461, 3462, 3463, 3464, 3465, 3466, 3467, 3468, 3469, 3470, 3471, 3472, 3473, 3474, 3475, 3476, 3477, 3478, 3479, 3480, 3481, 3482, 3483, 3484, 3485, 3486, 3487, 3488, 3489, 3490, 3491, 3492, 3493, 3494, 3495, 3496, 3497, 3498, 3499, 3500, 3501, 3502, 3503, 3504, 3505, 3506, 3507, 3508, 3509, 3510, 3511, 3512, 3513, 3514, 3515, 3516, 3517, 3518, 3519, 3520, 3521, 3522, 3523, 3524, 3525, 3526, 3527, 3528, 3529, 3530, 3531, 3532, 3533, 3534, 3535, 3536, 3537, 3538, 3539, 3540, 3541, 3542, 3543, 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556, 3557, 3558, 3559, 3560, 3561, 3562, 3563, 3564, 3565, 3566, 3567, 3568, 3569, 3570, 3571, 3572, 3573, 3574, 3575, 3576, 3577, 3578, 3579, 3580, 3581, 3582, 3583, 3584, 3585, 3586, 3587, 3588, 3589, 3590, 3591, 3592, 3593, 3594, 3595, 3596, 3597, 3598, 3599, 3600, 3601, 3602, 3603, 3604, 3605, 3606, 3607, 3608, 3609, 3610, 3611, 3612, 3613, 3614, 3615, 3616, 3617, 3618, 3619, 3620, 3621, 3622, 3623, 3624, 3625, 3626, 3627, 3628, 3629, 3630, 3631, 3632, 3633, 3634, 3635, 3636, 3637, 3638, 3639, 3640, 3641, 3642, 3643, 3644, 3645, 3646, 3647, 3648, 3649, 3650, 3651, 3652, 3653, 3654, 3655, 3656, 3657, 3658, 3659, 3660, 3661, 3662, 3663, 3664, 3665, 3666, 3667, 3668, 3669, 3670, 3671, 3672, 3673, 3674, 3675, 3676, 3677, 3678, 3679, 3680, 3681, 3682, 3683, 3684, 3685, 3686, 3687, 3688, 3689, 3690, 3691, 3692, 3693, 3694, 3695, 3696, 3697, 3698, 3699, 3700, 3701, 3702, 3703, 3704, 3705, 3706, 3707, 3708, 3709, 3710, 3711, 3712, 3713, 3714, 3715, 3716, 3717, 3718, 3719, 3720, 3721, 3722, 3723, 3724, 3725, 3726, 3727, 3728, 3729, 3730, 3731, 3732, 3733, 3734, 3735, 3736, 3737, 3738, 3739, 3740, 3741, 3742, 3743, 3744, 3745, 3746, 3747, 3748, 3749, 3750, 3751, 3752, 3753, 3754, 3755, 3756, 3757, 3758, 3759, 3760, 3761, 3762, 3763, 3764, 3765, 3766, 3767, 3768, 3769, 3770, 3771, 3772, 3773, 3774, 3775, 3776, 3777, 3778, 3779, 3780, 3781, 3782, 3783, 3784, 3785, 3786, 3787, 3788, 3789, 3790, 3791, 3792, 3793, 3794, 3795, 3796, 3797, 3798, 3799, 3800, 3801, 3802, 3803, 3804, 3805, 3806, 3807, 3808, 3809, 3810, 3811, 3812, 3813, 3814, 3815, 3816, 3817, 3818, 3819, 3820, 3821, 3822, 3823, 3824, 3825, 3826, 3827, 3828, 3829, 3830, 3831, 3832, 3833, 3834, 3835, 3836, 3837, 3838, 3839, 3840, 3841, 3842, 3843, 3844, 3845, 3846, 3847, 3848, 3849, 3850, 3851, 3852, 3853, 3854, 3855, 3856, 3857, 3858, 3859, 3860, 3861, 3862, 3863, 3864, 3865, 3866, 3867, 3868, 3869, 3870, 3871, 3872, 3873, 3874, 3875, 3876, 3877, 3878, 3879, 3880, 3881, 3882, 3883, 3884, 3885, 3886, 3887, 3888, 3889, 3890, 3891, 3892, 3893, 3894, 3895, 3896, 3897, 3898, 3899, 3900, 3901, 3902, 3903, 3904, 3905, 3906, 3907, 3908, 3909, 3910, 3911, 3912, 3913, 3914, 3915, 3916, 3917, 3918, 3919, 3920, 3921, 3922, 3923, 3924, 3925, 3926, 3927, 3928, 3929, 3930, 3931, 3932, 3933, 3934, 3935, 3936, 3937, 3938, 3939, 3940, 3941, 3942, 3943, 3944, 3945, 3946, 3947, 3948, 3949, 3950, 3951, 3952, 3953, 3954, 3955, 3956, 3957, 3958, 3959, 3960, 3961, 3962, 3963, 3964, 3965, 3966, 3967, 3968, 3969, 3970, 3971, 3972, 3973, 3974, 3975, 3976, 3977, 3978, 3979, 3980, 3981, 3982, 3983, 3984, 3985, 3986, 3987, 3988, 3989, 3990, 3991, 3992, 3993, 3994, 3995, 3996, 3997, 3998, 3999, 4000, 4001, 4002, 4003, 4004, 4005, 4006, 4007, 4008, 4009, 4010, 4011, 4012, 4013, 4014, 4015, 4016, 4017, 4018, 4019, 4020, 4021, 4022, 4023, 4024, 4025, 4026, 4027, 4028, 4029, 4030, 4031, 4032, 4033, 4034, 4035, 4036, 4037, 4038, 4039, 4040, 4041, 4042, 4043, 4044, 4045, 4046, 4047, 4048, 4049, 4050, 4051, 4052, 4053, 4054, 4055, 4056, 4057, 4058, 4059, 4060, 4061, 4062, 4063, 4064, 4065, 4066, 4067, 4068, 4069, 4070, 4071, 4072, 4073, 4074, 4075, 4076, 4077, 4078, 4079, 4080, 4081, 4082, 4083, 4084, 4085, 4086, 4087, 4088, 4089, 4090, 4091, 4092, 4093, 4094, 4095, 4096, 4097, 4098, 4099, 4100, 4101, 4102, 4103, 4104, 4105, 4106, 4107, 4108, 4109, 4110, 4111, 4112, 4113, 4114, 4115, 4116, 4117, 4118, 4119, 4120, 4121, 4122, 4123, 4124, 4125, 4126, 4127, 4128, 4129, 4130, 4131, 4132, 4133, 4134, 4135, 4136, 4137, 4138, 4139, 4140, 4141, 4142, 4143, 4144, 4145, 4146, 4147, 4148, 4149, 4150, 4151, 4152, 4153, 4154, 4155, 4156, 4157, 4158, 4159, 4160, 4161, 4162, 4163, 4164, 4165, 4166, 4167, 4168, 4169, 4170, 4171, 4172, 4173, 4174, 4175, 4176, 4177, 4178, 4179, 4180, 4181, 4182, 4183, 4184, 4185, 4186, 4187, 4188, 4189, 4190, 4191, 4192, 4193, 4194, 4195, 4196, 4197, 4198, 4199, 4200, 4201, 4202, 4203, 4204, 4205, 4206, 4207, 4208, 4209, 4210, 4211, 4212, 4213, 4214, 4215, 4216, 4217, 4218, 4219, 4220, 4221, 4222, 4223, 4224, 4225, 4226, 4227, 4228, 4229, 4230, 4231, 4232, 4233, 4234, 4235, 4236, 4237, 4238, 4239, 4240, 4241, 4242, 4243, 4244, 4245, 4246, 4247, 4248, 4249, 4250, 4251, 4252, 4253, 4254, 4255, 4256, 4257, 4258, 4259, 4260, 4261, 4262, 4263, 4264, 4265, 4266, 4267, 4268, 4269, 4270, 4271, 4272, 4273, 4274, 4275, 4276, 4277, 4278, 4279, 4280, 4281, 4282, 4283, 4284, 4285, 4286, 4287, 4288, 4289, 4290, 4291, 4292, 4293, 4294, 4295, 4296, 4297, 4298, 4299, 4300, 4301, 4302, 4303, 4304, 4305, 4306, 4307, 4308, 4309, 4310, 4311, 4312, 4313, 4314, 4315, 4316, 4317, 4318, 4319, 4320, 4321, 4322, 4323, 4324, 4325, 4326, 4327, 4328, 4329, 4330, 4331, 4332, 4333, 4334, 4335, 4336, 4337, 4338, 4339, 4340, 4341, 4342, 4343, 4344, 4345, 4346, 4347, 4348, 4349, 4350, 4351, 4352, 4353, 4354, 4355, 4356, 4357, 4358, 4359, 4360, 4361, 4362, 4363, 4364, 4365, 4366, 4367, 4368, 4369, 4370, 4371, 4372, 4373, 4374, 4375, 4376, 4377, 4378, 4379, 4380, 4381, 4382, 4383, 4384, 4385, 4386, 4387, 4388, 4389, 4390, 4391, 4392, 4393, 4394, 4395, 4396, 4397, 4398, 4399, 4400, 4401, 4402, 4403, 4404, 4405, 4406, 4407, 4408, 4409, 4410, 4411, 4412, 4413, 4414, 4415, 4416, 4417, 4418, 4419, 4420, 4421, 4422, 4423, 4424, 4425, 4426, 4427, 4428, 4429, 4430, 4431, 4432, 4433, 4434, 4435, 4436, 4437, 4438, 4439, 4440, 4441, 4442, 4443, 4444, 4445, 4446, 4447, 4448, 4449, 4450, 4451, 4452, 4453, 4454, 4455, 4456, 4457, 4458, 4459, 4460, 4461, 4462, 4463, 4464, 4465, 4466, 4467, 4468, 4469, 4470, 4471, 4472, 4473, 4474, 4475, 4476, 4477, 4478, 4479, 4480, 4481, 4482, 4483, 4484, 4485, 4486, 4487, 4488, 4489, 4490, 4491, 4492, 4493, 4494, 4495, 4496, 4497, 4498, 4499, 4500, 4501, 4502, 4503, 4504, 4505, 4506, 4507, 4508, 4509, 4510, 4511, 4512, 4513, 4514, 4515, 4516, 4517, 4518, 4519, 4520, 4521, 4522, 4523, 4524, 4525, 4526, 4527, 4528, 4529, 4530, 4531, 4532, 4533, 4534, 4535, 4536, 4537, 4538, 4539, 4540, 4541, 4542, 4543, 4544, 4545, 4546, 4547, 4548, 4549, 4550, 4551, 4552, 4553, 4554, 4555, 4556, 4557, 4558, 4559, 4560, 4561, 4562, 4563, 4564, 4565, 4566, 4567, 4568, 4569, 4570, 4571, 4572, 4573, 4574, 4575, 4576, 4577, 4578, 4579, 4580, 4581, 4582, 4583, 4584, 4585, 4586, 4587, 4588, 4589, 4590, 4591, 4592, 4593, 4594, 4595, 4596, 4597, 4598, 4599, 4600, 4601, 4602, 4603, 4604, 4605, 4606, 4607, 4608, 4609, 4610, 4611, 4612, 4613, 4614, 4615, 4616, 4617, 4618, 4619, 4620, 4621, 4622, 4623, 4624, 4625, 4626, 4627, 4628, 4629, 4630, 4631, 4632, 4633, 4634, 4635, 4636, 4637, 4638, 4639, 4640, 4641, 4642, 4643, 4644, 4645, 4646, 4647, 4648, 4649, 4650, 4651, 4652, 4653, 4654, 4655, 4656, 4657, 4658, 4659, 4660, 4661, 4662, 4663, 4664, 4665, 4666, 4667, 4668, 4669, 4670, 4671, 4672, 4673, 4674, 4675, 4676, 4677, 4678, 4679, 4680, 4681, 4682, 4683, 468

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XT Model 089	\$500	\$550	\$450
AT Model 099	\$650	\$775	\$500
AT Model 239	\$725	\$925	\$700
AT Model 339	\$875	\$1,000	\$800
PS/2 Model 30-286	\$1,100	\$1,300	\$1,000
PS/2 Model 60	\$1,300	\$1,700	\$1,300
PS/2 Model 70P	\$3,200	\$3,500	\$3,000
Compaq Portable II	\$900	\$1,050	\$875
Portable 286	\$1,100	\$1,350	\$1,000
SLT 286	\$2,250	\$2,500	\$2,000
Portable 386	\$2,300	\$2,500	\$2,200
LTE 286	\$2,200	\$2,500	\$1,900
Deskpro 286	\$500	\$1,000	\$700
Deskpro 386/20	\$2,150	\$3,000	\$2,000
Apple Macintosh Plus	\$750	\$975	\$700
SE	\$1,125	\$1,250	\$1,100
II	\$2,600	\$2,800	\$2,400
HCX	\$3,300	\$3,800	\$3,200
IIIfx	\$5,900	\$6,500	\$5,900

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EDUCATION & TRAINING

Future looks a little brighter for CBT

BY MARK PRITZ
SPECIAL TO CWT

Computer-based training (CBT), the self-instructional learning that has never been able to out-run the traditional instructor-led pack, is starting to catch up—just a little bit.

Ironically, although CBT has been rejected because of its traditionally high start-up costs, the current economic downturn is providing a catalyst for its use by corporate information systems trainers.

"CBT use is active, if not growing," says William Bramer, managing partner of change management research and development at Andersen Consulting.

Part of the reason is that when staff is out, those left assume additional duties, which requires more training with fewer trainers, says Marc Silver, manager of self-instruction development at Unisys Corp.

CBT is also making a bigger dent in the training industry be-

cause more companies are recognizing that it helps trainers become more productive. For example, trainers can manage the training function by tracking student answers and scores, modules completed and so on. Often referred to as computer-managed instruction, this capability has long been a common advantage of mainframe-based CBT.

Now that personal computer networks have become more prevalent—often using a mainframe as a central file server—more trainers are discovering the advantages of mainframe management.

Also stirring the CBT pot is users' demand for faster training. Bramer says classroom training is too slow and unre-

sponsive to change. "You could plan a workshop for three weeks from now, but by the time it rolls around, your information is dated," he says. The best way to keep up with changing information is to deliver instruction by machine, he adds.

In addition, CBT is a natural for embedded or concurrent training, says Eric Parks, president of Ask International, a custom-design training firm in Long Beach, Calif. "It's easy for people to see that the best way to teach software is with software," he says.

However, CBT has some negative images and problems that continue to stand in its way.

In the past, CBT was misunderstood, Parks says. It was seen as a "solve-all," which, he says, led to the misapplication of this powerful technology. Misapplication, in turn, resulted in black-sheep CBT programs that have given the whole field a bad name.

Using CBT with beginners has been one of the most flagrant misapplications. For example, an attempt to use CBT to teach Lotus Development Corp.'s 1-2-3 spreadsheet to beginners was a disaster, says Tori Coward, president of Tangent Computer Resources. When her company sent CBT disks to the students, many sent them back, saying 1-2-3 was too hard to learn.

"We later found out that these people hadn't even tried to use [1-2-3]; they hadn't gotten past

the CBT lesson," she says.

The confusion surrounding development tools for CBT has also stunted the technology's growth. Trainers often find that an authoring system is either too complex to learn or too simple to do the job properly. Add to that

early rise to stardom was the failure of interactive videodisc—a subset of CBT. Interactive videodisc still faces an uphill battle for acceptance, even though it was introduced 10 years ago.

Initially, interactive videodisc was to be the savior of CBT, combining the interactivity of CBT with the visual power of video to create a sort of super-CBT. Unfortunately, it was also over-

NOW THAT PERSONAL COMPUTER networks have become more prevalent—often using a mainframe as a central file server—more trainers are discovering the advantages of mainframe management functions.

The confusing assortment of products and the general lack of standards, and you start to understand why many training organizations have stuck to standard training techniques.

In addition, authoring tools are costly. Not only is the initial cost of most software high, but many vendors also tack on runtime licensing fees for any applications produced with these tools. Parks says the fees have inhibited the spread of CBT.

Further preventing CBT's

hyped and misapplied.

Trainers and users are not counting CBT out; instead, they're predicting a bright future for the beleaguered technology.

"Training is seen as a perk by most people. It gives them a chance to get away from their desks, go off-site, see their colleagues, get free coffee and doughnuts. They don't go: 'those things with CBT,'" Parks says.

Pritz is a free-lance writer based in Dedham, Mass.



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INDUSTRY ALMANAC

ACE AND THE INVESTOR

Judging by stock movement among its members, the Advanced Computing Environment (ACE) consortium unveiled two weeks ago has piqued investor interest. From industry analysts, though, ACE has drawn but a skeptical nod.

During the week following the April 9 announcement, Digital Equipment Corp. and Microsoft Corp. — ACE's two largest members — each surged two points, closing Tuesday at 65 and 112 1/4, respectively. Several other members also advanced, including Silicon Graphics, Inc., which picked up 1 1/4 points to 38 1/4.

However, now may not be the time to buy stock in ACE members if the decision is based purely on anticipated ACE accomplishments, brokerage analysts said. Mark Stahlman and Steve Ekenstam, analysts at Alex. Brown & Sons, Inc., said they do not expect ACE to dent the desktop computing market until late 1992 or 1993. Even then, the installed base and shipment rates of workstations from Sun Microsystems, Inc., Hewlett-Packard Co. and IBM "may present too large a barrier" for ACE to penetrate, they added.

For short-term investing, Stahlman and Ekenstam recommended Silicon Graphics, despite its third-quarter profit drop of 64% posted Thursday. They predicted the firm's expected introduction of an under-\$10,000 workstation this fall to stir sales.

Sentiment varies for ACE leader Compaq Computer Corp. Alex. Brown rates it a "buy," while UBS Securities, Inc. suggested holding Compaq stock, at least for now, because of uncertain near-term demand for personal computers. UBS analyst Marc Schulman said he is confident in Compaq's future, in part because of its involvement with ACE. He called Compaq "attractive on an intermediate-to-long-term basis."

Even though ACE members have agreed to build processors from MIPS Computer Systems, Inc. into their hardware, MIPS is now rated a "source of funds" by Stahlman and Ekenstam, who noted the company's current high stock valuation. MIPS' long-term prospects look better, they said, because the consortium gives MIPS "a shot at considerable business that otherwise would be defaulted to other contenders."

Meanwhile, Schulman said, DEC now hovers on the rim of what could be a profitable new market for its desktop computers. Yet, he remained neutral on DEC shares in the short term because DEC has been hurt this year by battered demand for its VAX 9000.

Schulman added that new workstations from HP may bite into DEC's business. "It's 1992, not 1991, for DEC's renaissance," he said.

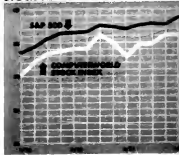
HP, which is not a member of the consortium, is rated a "buy," by Schulman. While ACE may become a problem for HP two years from now — when Schulman predicts the group will likely assert its own in the workstation market — "this year, HP's new machines will be more important than its exclusion from ACE," he said.

Sun, decidedly not an ACE partner, looks like a good buy to several Wall Street watchers. Richard Shaffer, editor of "Computer Letter," an industry newsletter, said Sun has a large lead in the workstation arena, a situation he said that it may preclude ACE from being more than a "last-place entrant in the traditional workstation market."

Instead, the coalition should concentrate on high-performance distributed systems, according to Shaffer.

KIM S. NASH

STOCK TRADING INDEX



Computerworld Stock Trading Summary

CLOSING PRICES FRIDAY, APRIL 18, 1991

TOP PERCENT GAINERS

Western Corp.	30.00	Seagate Technology	29.75
Perseus Graphics Equipment	21.25	Intel & Technology Pte.	29.75
LLR Corp.	20.51	Dell Computer Corp.	28.50
Sony Electronics Corp.	18.21	Seagate Technology	28.50
Western Digital Corp.	17.00	ATI Research Inc.	24.75

TOP PERCENT LOSERS

QDC	18.00	327CM Corp.	8.00
AT&T	59.00	AT&T	49.13
Advanced Computer Corp.	48.13	Advanced Computer Corp.	48.13
Bullitt Corp.	41.83	Bullitt Corp.	41.83
CompuLink Corp.	41.83	CompuLink Corp.	41.83
CompuLink Corp.	41.83	CompuLink Corp.	41.83
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CompuLink Corp.	41.83	CompuLink Corp.	41.83

TOP DOLLAR GAINERS

Digital Equipment Corp.	6.00	Apple Computer Inc.	42.13
Advanced Inc.	4.13	ATI Research	41.83
Storage Technology	3.75	Seagate Technology	41.83
System Software Systems	3.25	Dell Computer Corp.	41.83
United Venture	2.75	Sony Electronics Inc.	41.83

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THIS WEEK'S HIGHLIGHTS

- Disappointed with Apple Computer, Inc.'s second-quarter profits, investors knocked Apple shares back 10 points last week to close Thursday at 61. Other micro-computer makers also stumbled. Computer Compaq Corp. lost 3 1/4 points to 61 1/4, and Dell Computer Corp. slid 4 1/4 points to 25 1/4.
- After posting better-than-anticipated earnings, Digital Equipment Corp. advanced 5 1/4 points to 70 1/4. IBM continued to lose after making official its weak first-quarter financials, dropping 1/4 of a point for the week to 109 1/4.
- Among software makers, Lotus Development Corp.'s reported 71% profit dip for the quarter did not stop its stock from jumping 1 1/4 points to 29 1/4. Microsoft Corp. closed Thursday at 110, down one point.
- Seagate Technology, Inc. reported lower-than-expected profits; its stock then fell far and fast, tumbling 5 1/4 points to 13 1/4. Storage Technology Corp. added 2 1/4 points to 40 1/4 as it reported steady earnings gains.

APRIL 18, 1991

50 Vol. 18 No. 18

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APRIL 18, 1991

APRIL 18, 1991

APRIL 18, 1991

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Banks

FROM PAGE 1

banks are guarding their territories by planning innovations such as credit/debit cards. Offerings such as these demand that IS be inextricably linked to business strategy.

"It puts a large burden on the technology to bring together deposit and credit information,"

Hold that line

More than 75% of firms in the *Finance/insurance/real estate* sector are keeping 1991 capital expenditures at or below 1990 levels

Capital expenditures
(Finance, insurance and
real estate sector)

1990 vs. 1991

Increase
23.1%

Percent of firms

"Projected"

Source: The DRI/Bentley Corp.
C.W. Chase, Director, J. John

said Robert Spicer, chief information officer at Chevy Chase Federal Savings in Chevy Chase, Md. "The platforms for deposit and credit have been independently developed, but now they'll have to be networked."

New competition "just exacerbates the problems in an industry that already has too much capacity," said Brian Phillips, executive vice president of technical services at Norwest Corp. in Minneapolis. "Isn't it interesting how many people want to get into this business, despite all the current financial problems? It's viewed as a very lucrative long-term business."

Norwest hopes to fight back with IS-improved customer service. It is currently piloting a personal computer-based system that will allow branch employees to compare multiple bank products simultaneously on the desktop. "We're moving from branch automation to sales assistance," Phillips said.

Another look

More than ever, bank executives say they want to use an IS dollar returned in market share, new customers or new fee-based services.

"We have had to re-evaluate the cost/value relationship of IS," said Michael Fichter, vice president of technology strategic planning at Bankers Trust Corp. in New York. "We're still spending heavily in areas where we feel we can make money."

Many banks are now moving to correct the excesses of the 1980s, when deregulation and the global economic boom sparked a giddy expansion mentality that resulted in a hodgepodge of incompatible systems at many banks. Bank of Boston, for example, had no fewer than 11 hardware platforms and 55 databases, which it is now trying to streamline in a five-year IS architecture plan (CW, Dec. 10, 1990).

Like Bank of Boston, The Chase Manhattan Bank NA in New York suffered a huge loss (\$334 million) last year. Chase's actions are typical of the way in which many large banks have reacted to the current adversity; it is not slashing IS but, rather, spending selectively.

"Like all other areas of the bank, we need to save money and get things done sooner," said Elaine Bond, executive vice president of corporate systems. "Sometimes this means adding systems; sometimes it means taking them away." Chase has cut back its European operations, for example, while speed-

"ISN'T IT INTERESTING how many people want to get into this business, despite all the current financial problems? It's viewed as a very lucrative long-term business."

BRIAN PHILLIPS
NORWEST

ing more on new applications in its credit-card business.

As the loan side of the banking business has soared, banks are looking to squeeze profits out of other areas — and they are looking to IS to help identify those areas. Systems that can do so are being spared the budget ax.

Substantial savings

PNC Financial Corp. in Pittsburgh, the nation's 14th largest bank, said it has such an application: Internal Management Profitability Reporting (IMPR). Co-developed with Hogan Systems, Inc. at a \$5.5 million cost to PNC

acts in other areas, but it is hiring 30 people to use and update IMPR. "It was never in jeopardy," said William J. Johns, controller at the firm.

While spending continues in strategic areas, finding fat to cut is far from easy. Many systems, even if outmoded and expensive to maintain, have become so essential to the business that they are sacred. Banks can hold firm on capital expenditures (see chart at left), but many are finding that data center consolidations and outsourcing are the only ways to save significant amounts of money.

"Most of the people are maintaining code, operating the

Technological distinctions

The largest financial institutions have vastly different technology priorities than those of the second tier

- Buy more PCs
- Review IS costs to reduce
- Re-examine PC policies and procedures
- Improve costs and security
- Buy more software

Source: Computer-Based Systems, Inc.

Financial. IMPR allows executives to analyze profitability by products, even very small ones. PNC Financial recently sold its Louisville, Ky.-based lockbox operations after IMPR helped show financial analysts that it was costing as much as it was bringing in.

PNC Financial lost \$166 million in the fourth quarter and is scaling back or deferring pro-

Financial institutions

by asset size
(ranked by order of frequency of response)

\$501m to \$250m	Over \$250m
1	2
6	1
9	3
19	4
13	5

C.W. Chase, Director, J. John

data center or monitoring telecommunications," said Diego Teixeira, a partner at Ernst & Young's Information Technology Center in Boston. "It's very hard to find sizable cutbacks in IS."

Feeling the pinch

One area feeling the pinch is the hired guns of programming and consulting. Republic National Bank in New York has cut its use of outside consultants by an estimated 80% to 85% in the past two years but has not laid off any full-time employees.

"If you're adequately staffed and don't have twice as many people as you need, there's not a lot you can do," said Ray Tymoczko, senior vice president. "Very little is discretionary."

With some exceptions, the leading banks realize that IS has long since passed the point of being a lock-office, overhead function ripe for major cuts in tough times. Spending on technology for technology's sake is a luxury most banks can ill afford, but funding for strategic areas remains available — and necessary.

"I get frustrated with the notion that systems is a class by itself," Bond said. "We're talking about the guts of the bank here. I wouldn't look for any dramatic changes."

No more turmoil?

Turmoil is nothing new to BankAmerica Corp.'s IS organization.

The nation's second largest bank is now led by its eighth IS chief since the mid-1980s, with the alumni club including high-profile Max Hopper at AMR Corp. and Michael Swannick at Bank of Boston. BankAmerica, based in Concord, Calif., still prefers that its executives not respond to questions about its past IT turnover.

Compared with many of its brethren on the East Coast and elsewhere, however, BankAmerica may now have one of the most stable IS organizations. It has resolved a longtime centralized vs. decentralized debate by bifurcating IS into two "towers" supporting the retail and wholesale sides of the bank. Meanwhile, the bank has been profitable for two years.

"Now is no time to become complacent. 'There is less certainty about revenue than at any other time in the past,'" said Martin Stein, who left Paine Webber, Inc. to become executive vice president and head of BankAmerica Systems Engineering (Banc) last year. "Cutting costs is one of the bank's six major objectives for 1991, and Banc is clearly a big contributor to cost," Stein said.

The \$110 billion bank is hunting for savings in many different corners. In addition to consolidating data centers (see story bottom left), BankAmerica expects to save an estimated \$750,000 per year by "re-engineering" management of its California Data Network, formerly done by AT&T. "Given per size, we can find economies of scale inside the bank," said Senior Vice President Peter Hill.

As far as high-risk tenure at the top is concerned, Stein remains confident. "What might have been a death wish three years ago is now a very viable situation," Stein said. "At Paine Webber, I had eight predecessors in five years, so I might argue my risk is diminished."

CLINTON WILKER

Money Savers

Two actions that can save big \$5 dollars in the recession-plagued banking industry are consolidating data centers and outsourcing.

Manufacturers Ranover Trust Co. in New York, for example, is in the process of whittling a set of eight data centers down to two. The bank has invested in two IBM Enterprise Systems/9000s in hopes of eventually saving \$20 million to \$30 million per year on operations.

BankAmerica Corp. recently closed its Hong Kong data center and combined overseas operations in London. It is currently considering further consolidations among five U.S. centers.

Other notable consolidations include First Interstate Bancorp. in Los Angeles, which is combining five data centers into two, and Fleet/Norstar Financial Group, Inc. in Providence, R.I.

The outsourcing option has proven particularly appealing to banks experiencing financial

difficulty. Not every bank that chooses to outsource IS is operating in the red, but many are. Of the nation's top 100 banks, seven that lost money in 1990 have farmed out IS operations.

- Southeast Banking Corp. in Miami lost \$199 million; has outsourced to IBM.
- First City Bancorp. of Texas in Houston lost \$158 million; has outsourced to Electronic Data Systems Corp. (EDS).
- First American Bankshares, Inc. in Washington, D.C., lost \$142.3 million; has outsourced to Perot Systems, Inc.
- Riggs National Corp. in Washington, D.C., lost \$57 million; has outsourced to IBM.
- Hibernia Corp. in New Orleans lost \$11 million; has outsourced to IBM.
- First Fidelity Bancorp. in Newark, N.J., lost \$6 million; has outsourced to EDS.
- Bank South NA in Atlanta lost \$4 million; has outsourced to IBM.

NEWS SHORTS

NEC to resell Stratus gear

NEC Corp. entered the on-line transaction processing arena last week by announcing it will resell Stratus Computer, Inc.'s new reduced instruction set computing-based system under its own label as NEC Super Tolerant FT20. Stratus' XAR Model 20, released last month and scheduled for shipment at year's end, is the industry's first fault-tolerant machine with a dual operating system, running either AT&T's Unix System V Release 4 or VMS. Stratus' proprietary operating system.

Slim pickings for IBM laptop buyers

IBM's new laptop computer is in tight supply. IBM claims the product, the Personal System/2 L40 SL, has been the firm's best-received personal computer ever. IBM said it has already received orders for 80% of what it expected to sell all year. But time dealers are unhappy. "I haven't seen one yet. It's ridiculous," said Matt Pisanomoni, a ComputerLand Corp. dealership owner in White Plains, N.Y. A Valcom, Inc. dealership in Wichita, Kan., received only one IBM laptop out of an order for 10. "It's no more frustrating than it was waiting for the Compaq [Computer Corp.] LTE. I'm getting used to it," Valcom representative Tim Madhetti said.

Index/Sage merger brings charge

Interact, Inc., the Rockville, Md.-based software development tool firm, announced a routine charge against earnings for the fourth quarter, ending April 30. The roughly \$20 million charge resulted from activities relating to the creation of Interact, which resulted from a merger of Sage Software, Inc. and Index Technology Corp. The amount included charges relating to a work force reduction of about 150 employees.

Spectrum net manager ships

Cabletron Systems, Inc.'s artificial intelligence-based Spectrum enterprise network management system formally started shipping last week. Spectrum gives users a central graphical representation of a multivendor network from several perspectives that can be as deep and broad as the user chooses. The vendor said it hopes to sell 100 Spectrum licenses in the next 12 months and added that it has the resources to install three Spectrum sites per week. Cabletron said it added 35 support staff members for Spectrum within the last six months. The firm also announced a 72% increase over last year in worldwide sales for its fiscal year ended Feb. 28. Sales totaled \$180.5 million, while profits grew 61% to \$35.9 million.

Pyramid adds high-end system

Nearly doubling the power of its Unix mainframe systems — to a claimed high end of 300 million instructions per second (MIPS), up from 168 MIPS — Pyramid Technology Corp. introduced its Mipserv S-series last week. The S-series begins at \$93,000 and could top out at about \$3.5 million, according to a spokesman.

DEC files Delta

Digital Equipment Corp. last week announced a \$4.6 million contract with Delta Air Lines to provide systems and services for automating the production and publication of aircraft maintenance information. Delta's Technical Operations Publishing System — the first on-line maintenance information system in the airline industry — will be based on VAX/VMS systems.

Knowledgeware fills out OS/2 line

Knowledgeware, Inc. has added two products to its line of OS/2-based computer-aided software engineering tools, seeking to pump up applications development for the struggling software platform. A rapid-application package reportedly gathers end-user business requirements during the analysis phase of development, reflects them in an operational prototype and automatically generates code. A documentation tool that integrates with the software development package keeps applications documentation up-to-date, the company said.

Wang to enhance imaging connections

BY ELLIS BOOKER
OF WASH.

LOWELL, Mass. — Seeking to increase the appeal of its imaging software to users of other computer platforms, Wang Laboratories, Inc. last week expanded its connectivity options for the IBM mainframe and Apple Computer, Inc. Macintosh worlds.

Analysts welcomed Wang's move away from its proprietary imaging based solely on its own VS minicomputer architecture.

"[Wang] is exceedingly pragmatic from a market viewpoint," said Miller Howard, program director of office information systems at Gartner Group, Inc. in Stamford, Conn. The company, he said, has "looked into the mirror" and realized it has to be a solutions provider using the hardware and software of others when necessary.

The mainframe software, Open/Image DMS/DC, allows applications running on IBM and compatible hosts to control Wang image processing, either on a Wang image server or a local network server.

The LAN product, Open/Image 3270 Windows, works on IBM's Systems Network Architecture network and allows mainframe applications to access

Wang imaging services on a personal computer network. The network image servers can run on standard PC LAN operating systems from Banyan Systems, Inc., Novell, Inc. and 3Com Corp.

Open/Image 3270 Windows works with both the newly introduced DMS/DC product and Open/Image CICS. Wang previously introduced the latter, which integrates Wang imaging services with IBM CICS applications.

Open/Image DMS/DC and Open/Image 3270 Windows are both scheduled to be available in June. The DMS/DC product will be priced at \$25,000, and the PC LAN offering, configured with 20 users, an image server, an optical jukebox and LAN and imaging software, cost \$320,580 (\$16,029 per user), according to Wang. Wang also vowed to bring forth support for other mainframe operating systems — specifically, MVS/ESA and DOS/VSE — but did not give a timetable.

For Macintosh users, Wang announced Macrs Image workstation software, which enables either stand-alone or networked

Macintoshes to connect with Wang VS image servers. Users can also mix Macintoshes and IBM Personal Computer AT-compatible systems over a network with the new software, which is scheduled to be available in May, Wang said.

Wang is offering two pieces of workstation software for the Macintosh. One, priced at \$550 per client, allows Macintosh clients to access VS data applications. Another, at \$1,500 per client, gives Macintoshes access to integrated data and image applications on the VS. Users will also need \$750-per-server.

Apple's Macintosh IIx software to link Macintoshes and VS hosts. The LAN software provides native AppleLink capabilities.

VS servers, and Macintoshes can be connected directly via an Ethernet option board or over a LocalTalk network, which connected to the LAN and server over a router.

Not unexpectedly, Wang said the next release of its PC software, due in June, would support Microsoft Corp.'s Windows 3.0. Moving up to Windows 3.0 is of interest to Nick Giamondi, manager of uniform systems at U.S. Steel Corp. in Pittsburgh. But Giamondi says he believes the Windows 3.0 version will execute faster than his current Wang WIS Windows system, which has a response time of about two seconds.

NCR bids

FROM PAGE 1

other magnetic and optical media.

NCR is clearly hoping to garner a piece of an exploding market. North American revenue from imaging systems grew from \$172 million in 1988 to \$911 million in 1990, according to BIS Strategic Decisions, a research firm in Norwell, Mass. That figure could climb to \$12.6 billion by 1995, BIS said.

Potential customers examining the NCR offering last week were particularly interested in how well DMS would fit into their existing systems.

Ray Tamayo, senior vice president at Republic National Bank in New York, said he was at the NCR announcement because "we're looking at putting in an imaging pilot in the third quarter. We've not narrowed it down to a vendor yet." He said his "main question was how well DMS integrates into its company's computing environment, which includes Digital Equipment Corp. and IBM computers.

Barbara Ripley, manager of office automation at Westinghouse Corp.'s commercial division in Baltimore, said her com-

pany is also looking to install an imaging system. Although Westinghouse has not yet selected a vendor, Ripley said one allure of the NCR system is that it is based on "open standards."

DMS includes scanners, high-resolution displays, servers, workstations, optical storage devices and laser printers. Prices range from approximately \$800,000 for a 20-workstation system to \$3.5 million for a 120-workstation system. In addition, NCR will sell the software components separately so users can image-enable their existing workstations and servers.

NCR's System 3000 Unix computers act as servers in the imaging network, with MS-DOS personal computers at the front end. Clients and servers are connected via Ethernet or Token Ring local-area networks.

Looking to Windows

Other features include terminal emulation to IBM mainframes and DEC computers as well as a data-compression scheme that allows imaging information to take up less bandwidth than would otherwise be required.

NCR is also providing applications development tools based on Microsoft Corp.'s Windows. The system is scheduled for

general availability in October. Manufacturers Hanover Trust Co. in New York has ordered DMS and will install it later this year, NCR executives said.

In the meantime, analysts said they are impressed with DMS. "NCR has gone a long way toward solving some of the nitty-gritty problems of imaging," said Thomas Nolle, president of CDMI Corp., a technology assessment consulting firm in Worcester, N.J.

"They've paid particular attention to how you substitute electronic distribution for manual routing of documents. It's the greatest strength of the system," he added.

Nolle also said that, unlike imaging systems from Unisys Corp. and other players, NCR's system is based on a single architecture. "It's a sign of a challenge to bring imaging into an organization without having to worry about integrating the imaging systems as well."

Bruce Silver, director of image management systems at BIS, said, "I'm favorably impressed that they've done a number of things right." In particular, he said, NCR's implementation of character recognition sets the system apart from others on the market.



Comten users not worried

Say AT&T buyout might even strengthen NCR's communications unit

BY GARY H. ANTHTES
CIVILIAN

BALTIMORE—Users of NCR Corp.'s Comten networking products seem resigned to soon becoming customers of AT&T, most saying the controversial buyout would either strengthen Comten or have no effect on it.

But a few users among the Comten Users' Exchange here last week worried that AT&T might spin off or sell the communications products unit, leaving product maintenance and enhancement in question.

"Most users see it as a done deal," said Ronald Block, president of the user group and a vice president at New York-based Donovan Data Systems, Inc. "And they view it positively. AT&T is a huge organization and a big user of Comten equipment. They know the children."

One Comten user at the U.S. Department of Health and Human Services said NCR's absorption by AT&T would make no difference to the agency, but a colleague disagreed. "The financial backing and the networking expertise of AT&T will help Comten. Both companies will benefit," he said.

John Ostrowski, a program-

mer at the Internal Revenue Service's Martinsburg, W. Va., computer center, said he was "not too worried." He said the IRS is moving toward open systems as part of its massive computer systems modernization, and that will offer alternatives to the proprietary Comten Systems Network Architecture (SNA) equipment now in use by the agency.

Fear of sale

An official at the National Aeronautics and Space Administration, which has much Comten gear, was troubled by the possibility that AT&T might sell NCR's Comten unit or just let it atrophy. "I don't see how Comten fits into AT&T's use strategy," he said.

Neither AT&T nor NCR would comment directly on Comten's future under an AT&T umbrella. "Until we've been able to sit down with NCR management and work out a transition plan, it's pure speculation," an AT&T spokesman said.

Comten was pointed to in a Dec. 2 letter in which AT&T Chairman Robert E. Allen told NCR Chairman and Chief Executive Officer Charles E. Eley Jr. that Allen intended to put

AT&T's computer business and NCR's business under NCR management. Allen also pledged to "maintain uninterrupted relationships with NCR employees, customers and suppliers," and he said, "it is not our intention that any NCR facilities will be closed."

Last year, NCR's Comten unit sold \$113 million in communications processors and other software and hardware for SNA, Transmission Control Protocol/Internet Protocol and Open Systems Interconnect networks. Comten was operated at arm's length until recently. In January, the sales and customer service groups of NCR and Comten were combined.

Frank Daback, president of Washington, D.C.-based Communications Network Architects, Inc., said one facet at AT&T's umbrella. "Until we've been able to sit down with NCR management and work out a transition plan, it's pure speculation," an AT&T spokesman said. "I don't see how Comten fits into AT&T's use strategy," he said. "I don't see how Comten fits into AT&T's use strategy," he said.

Allen: We need NCR but won't pay \$110 a share

BY MICHAEL FITZGERALD
CIVILIAN

CHICAGO—Calling himself "a very patient person," Robert E. Allen, chairman of AT&T, said last week that netting NCR Corp. was essential to AT&T's future growth. However, he told reporters that AT&T would not pay the \$110-per-share, or \$7.4 billion, asking price set by Charles E. Eley Jr., NCR's chairman and chief executive officer.

Allen's patience may be paying off. Eley prepared to remove the word "chairman" from his business card, after preliminary results of the shareholders' vote from NCR's annual meeting showed that he and three other NCR board members, including NCR President Gilbert Williamson, had been voted off the board. A special vote to oust the entire board fell far short, with only 52% of the needed 80% voting for it. The results are expected to be certified sometime this week.

The full statement that AT&T will not up its bid for NCR — AT&T has offered as much as \$100 per share for a friendly merger — did little to cool

NCR's rocketing stock price. Analysts said arbitrators are betting that a rise in AT&T stock, now trading at more than \$38 per share, will allow the company to renew a virtual three-for-one stock swap deal it had offered months before when AT&T stock traded near 30.

The record high bid by the Dow Jones Industrial Average last week "increases the odds we will see more money for NCR," said Charles Neuhauer, an analyst at Legg Mason Wood Walker, Inc. in Baltimore. "AT&T stock is up to the extent it should make it more palatable for them to offer a higher dollar value."

Allen made his remarks at AT&T's annual meeting, where the company announced a 6.6% increase in first-quarter profits — \$712 million on \$9.19 billion in sales, up from \$668 million on \$8.9 billion in sales one year ago.

Earlier in the week, NCR also announced better than expected results for the first quarter. NCR had record revenue of \$1.37 billion, although profits slipped to \$20 million. NCR claimed that profits would have risen 4% if it were not for costs related to fighting AT&T's takeover attempt.

AT&T laptop turns heads, but it's a jungle out there

ANALYSIS

BY MICHAEL FITZGERALD
CIVILIAN

NEW YORK—Today's laptop computer announcement from Safari Systems, the joint venture between AT&T Computer Systems Division and Marchetti America Corp., will turn heads, if not open corporate wallets.

The Safari laptop, based on Intel Corp.'s 80386SX chip, is distinctively styled. AT&T and Henry Dreyfus Associates, a design firm based here, developed a black matte case with a gray ridged "bumper" around the outside seams and a similarly styled handle. Attendees at last week's Laptop-Palmtop Expo

'91 here crowded around a Safari and generally seemed impressed with its design and features. However, they were a little put off by its \$5,399 price tag.

"What differentiates it is its software and its connectivity features," said Tim Babin, executive vice president at Creative Strategies International, Inc. in Santa Clara, Calif.

The most distinctive features are communications-oriented. AT&T has included a 2,400 bit/sec. internal fax/modem and a beta-test version of AT&T Mail Access Plus 2.2, a front-end to AT&T's Easy Link, the company said registered buyers will receive the finished version at a later date. Wireless messaging is possible with an option called the

Wireless Mailbox, and in the third quarter, a 9.6K bit/sec. internal fax/modem will be available. Another option will include a local-area network adapter from Xerox, Inc.

At 9 1/2 by 11 1/2 inches, the machine fits in a briefcase, and its full-size, 82-key keyboard has a better feel than many of its counterparts, although it is somewhat spongy. The 10-lb., IBM Video Graphics Array-compatible super-twisted display features electroluminescent backlighting.

Safari weighs 7 pounds, 2 ounces, or 7 pounds, 5 ounces with the handle. It has two built-in RJ11 phone jacks and two cables — one to hook to a display and one to hook to a wall jack.

It also features a system window, visible with the laptop closed or open, that uses icons to

croch Corp.'s DOS 4.01 EMM 386.sys applications behave improperly if full power management is on.

What remains to be seen is whether distinctive styling and

On Safari

AT&T's laptop has a handle of features — and a premium price

► **Processor:** Intel Corp. 30-MHz 80386SX
Speed 9.5 by 12 by 1.5 in.

Weight 7 pounds, 2 ounces without handle
Display 10-in. Active Graphics Array-compatible backlit, super-twisted screen

Memory/Storage 2M bytes of RAM, expandable to 6M bytes;
40M-byte hard disk, upgradeable to 80M bytes

Communications internal 2,400 bit/sec. fax/modem
Bundled software: Microsoft Corp.'s Windows 3.0, AT&T

EasyLink 2.2, Safari Systems' Faxage, Safari Systems Tourguide and Safari Utilities (modem diagnostics, temporary reconfiguration of system and password keyboard)
Phone 65.359

display the power source, indicate if batteries are low or whether automatic power management is in use and more.

When used with all its power management features, Safari's double nickel-cadmium batteries provide between four and six hours of battery life. Safari can be used with a single battery, and a third battery can be added, extending life to as long as nine hours.

However, AT&T's work with that Dorland International, Inc.'s Paradox Version 3.5 database, Quarterdeck Office Systems, Inc.'s Dosview 386 Version 2.3 with GEMM Version 5.1 and Mi-

croch Corp.'s DOS 4.01 EMM 386.sys applications behave improperly if full power management is on.

What remains to be seen is whether distinctive styling and

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TRENDS



The imaging market continues to gain momentum as many early adopters move from pilot systems to full production systems

Image Management Systems



System placements by industry

(North America sites)	1990	1991*	1992*	1993*
Services	280	376	908	1,666
Financial	352	450	1,029	1,790
Manufacturing	306	395	912	1,602
Government	338	437	1,004	1,760
Health	81	104	241	423

An early adopter, financial services continues to lead in both revenue and system placements

Revenue by system size

(in millions)	1990	1991*	1992*	1993*
Sub-work group	\$57	\$72	\$165	\$290
Work group	\$229	\$287	\$602	\$1,013
Departmental	\$375	\$469	\$972	\$1,618
Multi-departmental	\$191	\$315	\$589	\$1,079
Enterprise	\$52	\$77	\$121	\$188

Revenue figures include hardware, software and service revenue for new system placements, sales of add-on equipment, and support and maintenance costs

Sub-work-group and work-group systems dominate the market in units, but systems serving a single department with 15 to 70 workstations lead in revenue

Over the next five years, software is expected to represent an increasing percentage of the total revenue for new systems purchased

Percent of total revenue for new systems purchased



*Projected

Source: IDC Strategic Systems, Harvard, Mass.

CH Chart: Donald Maurer

NEXT WEEK

Quality software: What you get after spending millions of dollars fixing bugs. A joke? Not to those firms for whom this definition is all too real. But firms can develop quality software with an improvement plan that targets key IS areas — measurement, development, the maintenance or organization and more. See In Depth.



Exclusive *Computerworld*/Andersen Consulting survey examines executive attitudes toward information technology. Two years ago, many CEOs and other corporate officers were swooning over the idea of using IS for competitive advantage. Today, hard experience and cold reality have moderated executive hopes about IS. See Executive Report.

INSIDE LINES

Jim Manzi's Excel-ent adventure

Lotus' 1-2-3 for Microsoft's Windows went into beta testing last week with an initial rollout to about 20 of Lotus' top customers. By summer, Lotus chief Jim Manzi expects to have shipped from 1,000 to 2,000 beta-test copies. Manzi has to tailor specifics but did say customers love the backwards compatibility built into 1-2-3/W. He also hinted at a tighter "fit and finish" with other Lotus Windows-based products.

Did Dick Tracy beta-test this?

The Hewlett-Packard/Lotus palmtop will be introduced this week, along with new pager technology from Motorola that will reportedly allow HP palmtop users to receive text messages and incorporate them into applications virtually anywhere they happen to be.

Turnaround channel

A triumphant Gary Held, chief executive officer of Northgate Computer Systems, is expected to announce today that Northgate had a profit of \$2.24 million on \$46.94 million in sales in the first quarter of 1991. Held calls the last three months a turnaround case study made for Harvard Business School. Skeptics eyeing the brewing storm clouds of PC price pressures might point out that Harvard prefers businesses to do well for an entire year.

Vines outgrowth

Banyan Systems Vines users who are disappointed that the network does not yet support Apple Macintosh clients can take heart. One Vines customer at the recent user conference in Montreal said he had volunteered to be a Macintosh client beta-test site in six months, but Banyan had replied it would be ready for beta testing much sooner than that.

Looking for your Achilles' heel

Among the latest conference scams traveling around the Internet is a Trojan horse in the form of a game and mail message that asks the recipient to beta-test the game and provide the developer with feedback. The game includes a program designed to stealthily capture logons and passwords. In another scam, a message supposedly from the systems administrator asks users to temporarily change their passwords to a common password as part of a security check. In the interim, a hacker enters their accounts and sets up trapsdoors that allow him to freely return later.

A chicken-and-egg classic

A dedicated band of users and vendors, including DEC, IBM and the U.S. Department of Defense Internet folks, are doggedly trying to come up with an application programming interface (API) for TCP/IP. The protocol was originally designed "as an interoperability tool, not a program development tool," so it lacks the equivalent of Open Systems Interconnect Layer 5 or a standardized application interface, industry analyst Frank Dumbek says. With TCP/IP's recent apothecism into a de facto networking standard, however, vendors want that API so they can fill the demand for TCP/IP-based applications.

See you in the fall, maybe

Appearances — live and taped — by top-level IBM executives John Akers and Jack Rueseler last week are proof that concern over OS/2 has reached the highest echelons in the company. One unconfirmed story had Akers taking the same buses from IBM desktop software executives, telling them they will get them back once OS/2 Version 2.0 ships.

Into the chips

Among a gaggle of vendors ready to trot out systems based on Intel's i486SX — expected to be announced today — are AST and Advanced Logic Research.

One humorous line passed on to us last week had Sun's Scott McNeely responding to a query on how he measures his worth with the response: "McNeely" is an estimated reference to a recent report that Mr. Bill is worth \$4 billion. Your best lines should be directed to News Editor Pete Bartolotta at (800) 343-6474, faxed to (508) 875-8851 or lodged on CompuServe 76537,2413.

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